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ENERGY PROFILES OF CZECHOSLOVAKIA, HUNGARY AND POLAND, AND THEIR EMERGING FREE-MARKET ECONOMIES

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MEMORANDUM OF THE CHAIRMAN

To: Members of the Senate Committee on Energy and Natural Resources:

The dramatic events that occured in the Eastern European countries in 1989 entailed fundamental political and economic transformations in the Eastern Bloc and in Europe.

Although Soviet President Mikhail Gorbachev's Glasnost policy encounters at present all kinds of ethnic and social problems, the changes in Eastern European countries appear to be irreversible. These countries are facing extremely complex energy challenges at the international and domestic levels and serious problems of environmental degradation. They will need several years to implement a complete program of free market economic reforms and to restructure their energy sector.

The Eastern European countries are in dramatic need of new technologies, modern equipment, basic management skills, and financial aid. But they also represent important markets and can offer interesting investment opportunities for the future.

The Western countries are directly concerned with these events, because they will shape the future of the new post-Communist Europe, which will be integrated in the international trading system.

Hop Pham-Thi, the Committee's counsel for international energy issues, has prepared a review of the energy profile and policy for three key Eastern European countries. This report highlights the very complex problems that these countries are facing, with the reduction of the Soviet oil and gas imports, and the desintegration of the Council for Mutual Economic Assistance (CMEA), the Communist trading system based on barter. This report also stresses the historical and financial dimension of the problems in order to give a complete understanding of each Eastern European country's specific development.

The experts from international organizations remain relatively optimistic as regards to Eastern European countries' final achievement of free market economic reforms. Major former state enterprises in the oil, natural gas, and electricity sectors are in the process of being privatized and will be looking for foreign participation. Their future legal structure is currently being debated. Depending on their final status, some of these enterprises can offer interesting investment opportunities to U.S. companies.

J. BENNETT JOHNSTON, *Chairman.*

CONTENTS

	Page
Memorandum of the Chairman	III
Introduction	1
Methodology	3
Chapter I. The impact of Soviet policies on Eastern European countries	5
Chapter II. Czechoslovakia	
Executive Summary	11
I. Background	14
II. An energy profile of Czechoslovakia	15
III. Czechoslovakia's economic and financial situation	22
IV. Conclusion	25
Chapter III. Hungary	
Executive Summary	27
I. Background	30
II. An energy profile of Hungary	30
III. Hungary's economic and financial situation	38
IV. Conclusion	41
Chapter IV. Poland	
Executive Summary	43
I. Background	46
II. An energy profile of Poland	46
III. Poland's economic and financial situation	54
IV. Conclusion	56
Chapter V. U.S. Assistance Programs	
I. Background	59
II. The SEED Act	59
III. The Interagency Coordination Effort	60
IV. The EXIM Bank activities	63
V. Conclusion	64
Chapter VI. International Aid	
I. Background	65
II. G–24 Assistance Program to Eastern European Countries	66
III. Western Assistance in the Energy Sector	67
IV. Coordination of International Assistance	68
V. The Creation of the EBRD	69
VI. The Lubbers Memorandum and the EC Pan-Europe Energy Charter	69
VII. The Coordination Committee for Multilateral Export Controls (COCOM)	71
VIII. Conclusion	71
Summary and conclusions	77
Sources and bibliography	79
Abbreviations, conversion factors for energy units	81

ENERGY PROFILES OF CZECHOSLOVAKIA, HUNGARY AND POLAND, AND THEIR EMERGING FREE-MARKET ECONOMIES

INTRODUCTION

In 1989, the major political developments that occurred in Eastern European countries were accompanied by a strong desire to introduce free market economic reforms. These events were made possible mainly because the Glasnost policy adopted by Soviet President Mikhail Gorbachev revealed the failure of the socialist economic system.

In all the Eastern European countries, the modification of the political and economic structures will entail hardships and stress, all the more that after 45 years of communism and political censorship, expectations are high. The Eastern European population may see in a free market system a panacea to all problems. However, East Europeans will have to learn new working habits, including a responsible sense of entrepreneurship often linked to the notion of risk, a notion that did not exist in the Communist system.

New capital, new technology and a more efficient use of Eastern Europe's natural resources and skilled work force are greatly needed. More importantly, a whole economic structure needs to be implemented through the creation of a legal framework that would involve not only energy, but also all aspects and sectors of the economic activity.

The energy sector in the Eastern European countries is facing dramatic problems of environmental degradation and public health, obsolete if not unsafe equipment, and wasteful and inefficient use of energy sources that has been encouraged by a highly subsidized pricing system and a trading system within the Eastern bloc based on a desire for autarky for the region as a whole.

The choice of Czechoslovakia, Hungary and Poland for this report is mainly based on the fact that, more than other Eastern European countries, and even more than the Soviet Union, these countries have made a clear choice of a free market economy. These three countries, because of historical and cultural reasons, have a different approach of free market reforms and are at different stages of development. However, in each country, the drive towards democracy and the transition to a more market-oriented economy began some years ago.

Czechoslovakia initiated the movement in 1968, but was then put under close check until recently. Czechoslovakia is now going through a "velvet revolution".

Since 1968, Hungary has been through a reformist "20-year evolution," which makes its economy the most advanced in free market reforms.

Poland started its transformation some 10 years ago with the birth of the Solidarity movement and is undertaking a "shock treatment" intended to help it get through drastic economic reforms to a free market economy.

Hungary has already adopted a set of free market laws, but still has to go through additional reforms. Czechoslovakia and Poland need to set up a completely new legal structure as a necessary condition to attract business and foreign investments. Some of the reforms required in these countries were adopted in 1990, but most of them, including the denationalization and privatization of the main energy sectors, oil, gas, coal, and electricity will be debated and implemented in 1991 and even some years after. According to most experts, the process will be complicated and will take several years in proportion with the huge energy challenges that these countries face.

Although the task to accomplish is enormous, significant progress has been made, considering the former political and economic situation of these countries only a few years ago. Today, each country seems driven by a strong desire to succeed in its free market economic reforms.

Czechoslovakia, Hungary and Poland present common characteristics because of their specific links with the Soviet Union. However, the energy situation of each country is very different. These differences are explained by the existence of different domestic energy resources and different energy policies.

METHODOLOGY

The profound transformations that have occurred in Eastern European countries since mid-1989 have provided the basis for numerous studies that have been conducted. New studies are still being organized in these countries. The Eastern European countries' situation is far from being stabilized, and each day brings new changes and challenges: for example, domestic political and economic events or those occurring in the Soviet Republics and the 1990–1991 Persian Gulf war.

This report intends to inform the Committee on the Eastern European countries' energy situation, as completely and accurately as possible, given that some information may be subject to changes. The current system is undergoing substantial transformations and is still looking for its own identity. Also, some data may not always be reliable or even available because of the former Communist administrative system.

However, despite these technical difficulties, this report reviews the fundamental issues that characterize the Eastern European countries, the obstacles that need to be removed in order for these countries to have a sound and balanced energy policy, and the actions undertaken by the U.S. Government and international organizations in that matter.

The report focuses on the multiple aspects of the Eastern European countries' energy situation. Two very important variables command the success or failure of Eastern European countries' energy policy: the financial issue of getting the capital needed to reorganize, modernize and invest into the energy sector, and the economic reforms that will create the general legal framework of these countries. Both are essential preconditions to attract foreign business.

The Eastern European countries are still going through a transformation process. It is also necessary to give an historical perspective of their former situation, in order to better understand each country's specific development and the dynamics of its free market economy approach.

The basic data and information come from various sources, giving different points of view, ranging from official governmental institutions and international organizations to more business-oriented sources. All these sources were provided by experts who completed a mission in Eastern European countries. Also, professionals from the private sector, staff members from the U.S. Department of Energy, the State Department, the Department of Commerce, the Agency for International Development, the Overseas Private Investment Corporation, the Export-Import Bank, and experts from the European Community Commission and the World Bank were consulted in order to update the given information.

CHAPTER I. THE IMPACT OF SOVIET POLICIES ON EASTERN EUROPEAN COUNTRIES

Since 1945, the Soviet Union imposed upon the Eastern European countries its own model of economic and political organization in order to integrate Eastern Europe into a trading system based on the specialization of each country's productive capacity. The program was aimed at supporting the Soviet military effort.

Although the Communist system, which was based on three main principles of collectivization, planning and state subsidies, never succeeded in eliminating the national character of each Eastern European country, it engraved long lasting consequences on these countries' economies and working habits. The Communist economic strategy focused primarily on heavy industries at the expense of processing industries. Each nation's economic plan focused on the creation of large productive units rather than small enterprises, and on production at any cost in order to meet the Communist plan's objectives, whatever the consequence was for the energy consumption and the environment. Thus, the Eastern European countries' industrial structure was characterized by the predominance of the energy sector, iron and steel industry, basic chemicals, and heavy mechanics. All these industries operated under the control of state monopolies whose inefficient management quickly resulted in obsolete equipment and technological gaps.

The Council for Mutual Economic Assistance (CMEA) was imposed in 1949 by the Soviet Union on its European satellites as a response to the Marshall plan. The CMEA imposed a system totally controlled by state authorities that created a bilateral transaction system between the U.S.S.R. and the Eastern European countries. The U.S.S.R. would provide Eastern Europe with energy and commodities in exchange for manufactured products, based completely on barter (see figure 1). The trade deficit or surplus was paid for in "convertible rubles" that would leave the country with unusable balance.

The CMEA system had very negative effects on the countries' economic efficiency, because they were isolated from international competition and produced low quality, obsolete equipment sold only to the Soviet market. In 1989, the CMEA still represented a high percentage of the Eastern European countries' external trade (57 percent for Czechoslovakia, 81.5 percent for Poland, 60.2 percent for Hungary).

The modification of the Eastern European countries' economic structures will be very difficult because of their dependence on Soviet oil and gas imports. These countries are confronted with contradictory problems: they have the strong desire to reduce their economic links with the Soviet Union and build a competitive, modern economy, integrated in the international economic system but this desire is not compatible with their current energy con-

Figure I

Energy Imports to Eastern Europe

Percentages are share of imported supplies in the consumption of each fuel.

Source: Cambridge Energy Research Associates.

sumption and their heavy dependence on the Soviet Union energy imports. Furthermore, their standard of living is still far behind that of Western countries (see table 1).

The main problems in the energy sector of the Eastern European countries may be characterized as follows:

In the previous centrally planned economies, the structure of the energy sector was determined notably by political and administrative rather than commercial factors; prices were set at well below world market levels and played little part in allocating resources.

Table 1

Standard of Living in Eastern Europe and U.S.S.R.

	People per car	People per telephone	Daily calories per capita	Infant mortality per 1,000 live births
Bulgaria	8.3	5.0	3,642	15
Czechoslovakia	5.8	4.4	3,448	13
East Germany	4.8	4.7	3,814	9
Hungary	6.9	7.5	3,569	17
Poland	9.5	8.5	3,336	18
Romania	91.0	7.7	3,373	25
Yugoslavia	8.0	8.2	3,563	25
U.S.S.R.	23.8	8.7	3,399	25
U.S.	1.7	1.5	3,645	10
West Germany	2.2	1.6	3,528	8

Source: Cambridge Energy Research Associates.

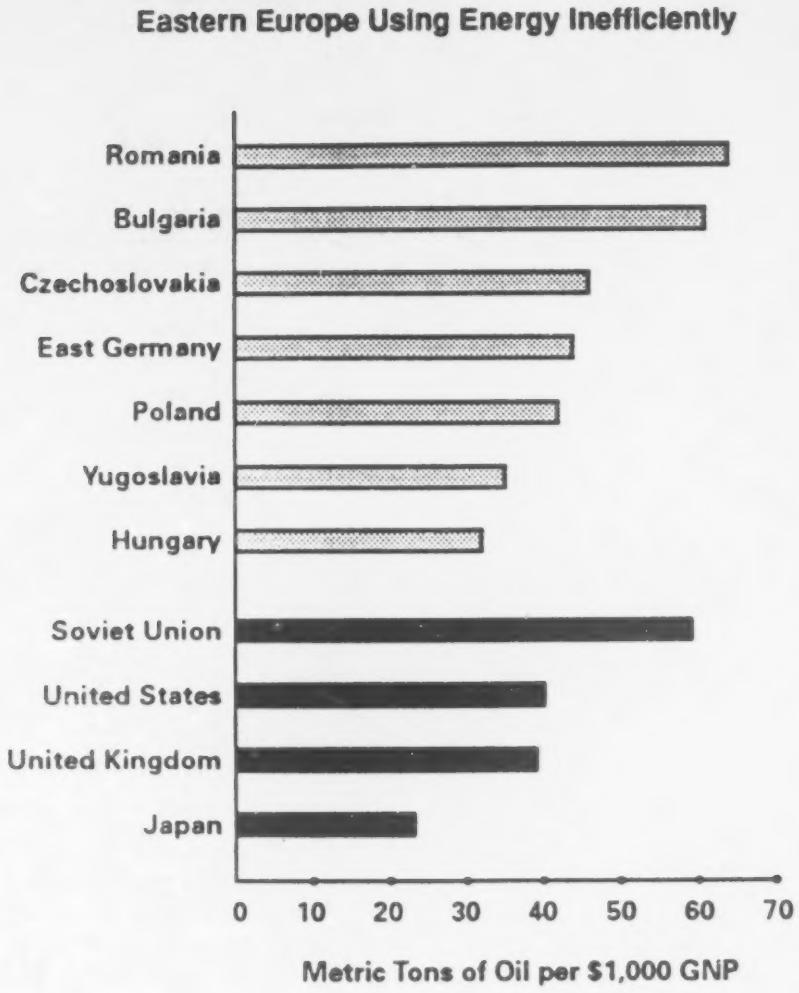
The absence of market signals resulted in great inefficiency in both production and consumption of energy (see chart 1).

Each CMEA country has a high dependency on a single energy source (notably coal in Poland and Czechoslovakia) and on a single foreign supplier (U.S.S.R.) of oil, natural gas and electricity. Coal represented in 1989 58 percent of their energy consumption (22 percent only in OECD-Europe), while oil accounted for 22 percent (43 percent in OECD-Europe) (see chart 2). With regard to the nuclear sector, the U.S.S.R. had an important role as supplier of nuclear technology to Czechoslovakia, Hungary, and Bulgaria. These countries need design and construction information on this technology in order to take full responsibility for nuclear safety.

Eastern Europe is having increasingly difficult supply problems with the U.S.S.R., leading to growing requirements for imports from other sources, mainly for oil. Furthermore, the Soviet Union has demanded to be paid in hard currency from 1991 on.

Poor energy management and a low energy efficiency characterize the centrally planned industries (including energy production and distribution) which represent a very high percentage of the Eastern European countries' energy consumption (see table 2).

Chart 1



Source: Cambridge Energy Research Associates.

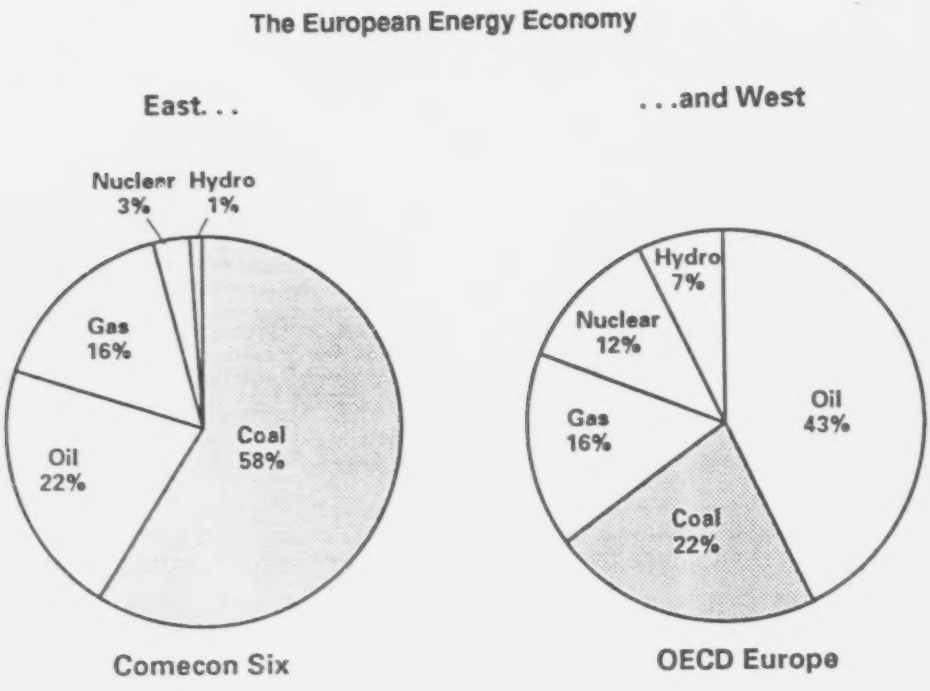
Eastern European economic policy resulted in severe environmental consequences from energy production and consumption. Potentially severe problems of nuclear safety exist.

There are two other technical problems:

1. There are severe difficulties of access to new technology and its assimilation. At the same time, during the transition period there are problems in ensuring availability of spare parts and maintenance of fuel supplies.

2. Data availability is poor, and rapidly changing industrial and energy consumption structures make the design of longer term strategies difficult.

Chart 2



Source: Cambridge Energy Research Associates.

Table 2.—STRUCTURE OF FINAL ENERGY CONSUMPTION OF THE CMEA

[Percent]

	Bulgaria	Hungary	Poland	GDR	Rumania	Czechoslovakia	CMEA [1]	Soviet Union	CMEA
Industry	32.3	36.1	41.9	35.6	76.1	51.7	48.6	50.5	50.0
Transports	23.3	7.8	9.5	7.4	2.7	11.2	8.9	15.3	13.7
Residential-Tertiary-Agriculture	41.9	45.0	46.2	53.2	19.3	34.3	39.3	24.6	28.2
Other than energy use	2.5	11.1	2.4	3.8	1.9	2.8	3.2	9.6	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Soviet Union not included.

Source: IEA.

All these problems have been exacerbated by the economic effects of the 1990–1991 Gulf crisis and the breakdown of the COMECON trading system. The double oil crisis (Gulf crisis and demand for payment in hard currency), in combination with the current

severe economic problems in the countries concerned, complicate the process of economic adjustment.

CHAPTER II. CZECHOSLOVAKIA

Executive Summary

Czechoslovakia is a small country, with limited natural resources (coal, lignite, uranium) and a significant environmental problem affecting Bohemia.

While Poland and Hungary were agricultural countries, Czechoslovakia has a long history as an industrial nation that dates back to the 19th century. To day, Czechoslovakia's economy is characterized by a disproportionately high percentage of energy intensive heavy industry; its per capita energy consumption is high, ranking just behind Rumania, Bulgaria and the Soviet Union. Czechoslovakia's industry needs to be modernized and restructured.

Czechoslovakia has to still deal with ethnic problems developing in the Slovak Republic that may endanger its political stability.

Czechoslovakia's energy mix is characterized by a significant portion of coal and lignite (58.4 percent of total primary energy consumption, and 83.8 percent of thermal electricity production, in 1987) while oil accounted for 20.9 percent, natural gas 11.9 percent, nuclear 8.8 percent.

In response to the Soviet Union's decision in 1982 to begin cutting oil exports, the former Communist government developed an energy strategy based on the development of coal and nuclear energy and increased utilization of natural gas.

At present, with the deep concern growing over the environment, the Czechoslovakian Government hopes to continue its policy of expanding the nuclear sector to replace coal in electrical power generation and developing natural gas for home heating.

However, Czechoslovakia's nuclear program was based on Soviet technology and is not without controversy, with opposition coming from Austria, Germany, and domestic public opinion.

The development of Czechoslovakia's hydroelectric capacity was frustrated in 1990 by Hungary's decision to withdraw from the joint construction of the Gabcikovo-Nagymaros Dam that would have provided 2.65 TWh per year of electrical energy.

Energy conservation measures should also be one of Czechoslovakia's primary goals, as well as the rationalizing of its energy price structure, so that industry and consumers pay the real value of the energy resources.

Czechoslovakia is currently negotiating loans with the World Bank that would finance studies as well as specific infrastructure projects. It also received financial aid from the EC Commission.

Since the Soviet Union has declared that it would guarantee deliveries of only 7.5 mt of crude oil to Czechoslovakia in 1991 (instead of the anticipated supply of 13 mt), Czechoslovakia is working on new accords for additional supplies, directly with Russia, the

43-538 O - 91 -- 2

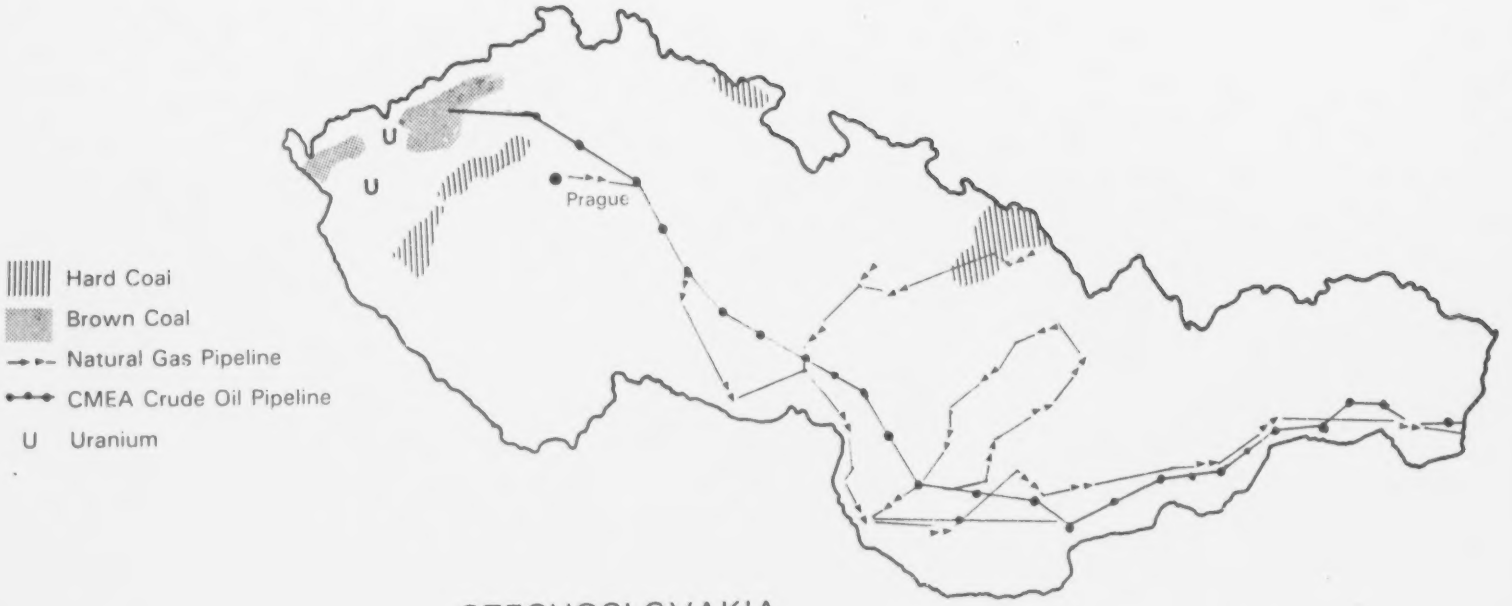
Ukraine, and Uzbekistan, and on a barter deal long term contract with Iran.

Czechoslovakia is also looking for other potential gas suppliers, such as Algeria, Iran, Norway, the Netherlands.

As regards to its free market economic reforms, Czechoslovakia did not benefit from the same liberalization that characterized Hungary's progressive economy for the past 20 years, because the economic reforms it undertook in April 1968 were doomed by the Soviet military intervention.

Although the dismantling of Czechoslovakia's centrally planned economy is less advanced than in Poland and Hungary, Czechoslovakia has taken affirmative steps towards privatization by adopting in 1990 major laws on Joint Stock Companies and Foreign Participation. An amendment allowing the repatriation of 100 percent of profits is expected to be introduced in 1991. Landmark legislation was recently adopted this year that transfers all nationalized industries to private investors.

Czechoslovakia has significant structural imbalances; however, its monetary and financial policy has always been very conservative. With a low external debt representing only 4 percent of its GNP, Czechoslovakia offers a financial situation to potential foreign investors (Japan, Germany, Austria) that is more sound than Poland and Hungary.



CZECHOSLOVAKIA

I. Background

Czechoslovakia is a small country about the size of the State of New York. The country has 15.6 million inhabitants (11.4 percent of the Eastern European population). Czechoslovakia has limited natural resources (lignite, coal, kaolin, wood, and uranium) and significant environmental problems.

Czechoslovakia is heavily industrialized. In 1987, mechanical equipment, tools, and industrial consumer products represented 74 percent of Czechoslovak exports. The Czechoslovak economy is characterized by high energy intensity (i.e., the amount of energy consumed per net unit of economic value produced) as a consequence of the disproportionate orientation towards heavy industry. One of Czechoslovakia's biggest challenges will be the modernization and reorganization of its economy.

Czechoslovakia has a long history as an industrial nation. This tradition dates back to the 19th century when Czechoslovakia was the industrial center of the Austro-Hungarian Empire. By 1938, Czechoslovakia had one of the most industrially developed economies in Europe. Its gross domestic product (GDP) was not far behind that of France. During the Second World War and thereafter Czechoslovakia's military production capability (iron, steel, manufacturing, basic chemistry, arms) was developed by the Germans and later by the Soviets.

In April 1968 Czechoslovakia undertook economic reforms that were, at that time, the most progressive in Eastern Europe. These economic reforms were doomed by the Soviet military intervention that crushed the political liberalization known as the Prague Spring. There followed a period of normalization (i.e., return to a strong political and economic centralism) during which Czechoslovakia was held in close check by the Soviet Union. Consequently, the Czechoslovak economy did not have the benefit of the same liberalization that has characterized Hungary's economy for the past 20 years.

Czechoslovakia has been a Federal state since 1968, and is composed of the Czech states (Bohemia, Moravia), and Slovakia. In 1990, Czechoslovakia was renamed the Czech and Slovak Federative Republic.

A popular, nonviolent uprising in November and December, 1989, the so-called "velvet revolution", resulted in a radical change in Czechoslovakia's governing regime. The new Czechoslovak President, Vaclav Havel, was unanimously elected, and his widespread popularity has bolstered Western confidence in the ultimate success of Czechoslovak democratization and economic restructuring. Although the ethnic problem with the Slovak Republic still exists, Vaclav Havel seems to have taken a conciliatory approach. The renaming of the republic in 1990 is a sign of this spirit.

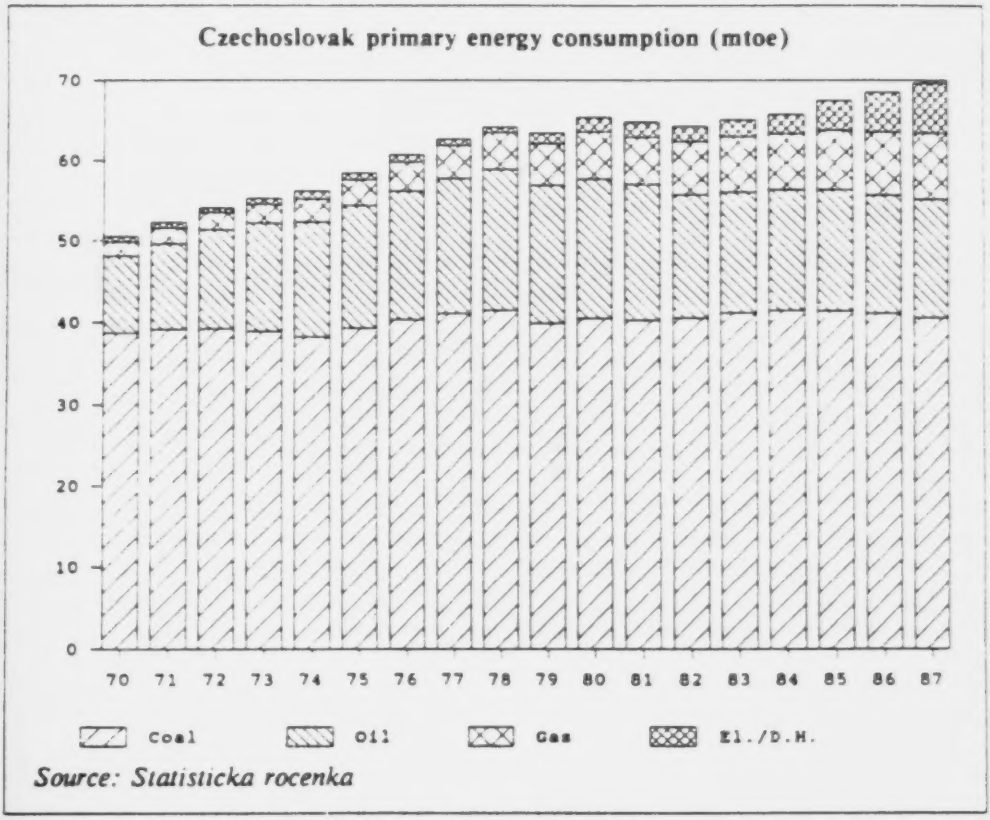
Czechoslovakia's debt policy has been very conservative. Compared to Hungary and Poland, Czechoslovakia has a very low external debt. This makes the Czechoslovak financial situation much sounder.

II. An Energy Profile of Czechoslovakia

A. Czechoslovakia's Energy Mix

Coal and lignite represent a significant portion of Czechoslovakia's energy mix. In 1987, coal and lignite accounted for 58.4 percent of total primary energy consumption and fueled 83.8 percent of thermal electricity production. Oil accounted for 20.9 percent of primary energy consumption, natural gas 11.9 percent, and nuclear 8.8 percent (see chart 3).

Chart 3



Source: Statisticka rocenka

B. Czechoslovakia's Energy Policy

In response to the Soviet Union's decision in 1982 to begin cutting oil exports, Czechoslovakia's former Communist government developed an energy strategy based on the development of coal and nuclear energy, and increased utilization of natural gas.

At present, the Federal Ministry of Economy, in conjunction with the Czech and Slovak Ministries of Economy, is responsible for Czechoslovak energy policy. The Czechoslovak Government hopes to use the deep concern over the environment to develop sup-

port for a continuation of its policy of expanding the nuclear sector, replacing coal in electric power generation, and developing natural gas for home heating. The Czechoslovak Parliament will debate energy policy options this year.

It would appear that energy conservation also should be one of the primary goals of Czechoslovak energy policy. Ultimately, this can be best accomplished by rationalizing the country's pricing structure so that industry and consumers pay the true value of the energy resources that they consume.

Czechoslovakia is negotiating loans with the World Bank that would help it to implement an updated energy policy. The World Bank loans would finance studies as well as specific infrastructure projects.

C. CZECHOSLOVAKIA'S ENERGY RESOURCES

1. Coal and Lignite

Coal and lignite are Czechoslovakia's greatest domestic energy resources. Czechoslovakia has black coal reserves estimated to total 4.5 billion tonnes and brown coal and lignite reserves estimated to total 5.5 billion tonnes. According to Czechoslovak estimates, the country's black coal reserves would be exhausted in 40–60 years if mining continues at the current rate. Brown coal reserves would be exhausted in 30 years at current extraction rates. Without massive investments in modern mining technology, however, the recoverable resource base is probably much smaller than these estimates would indicate.

Czechoslovak coal production is controlled by the Ministry of Industry and Energy. The ministry has divided the country into 11 coal-producing districts, five of which produce black coal, seven brown coal and lignite. The Ostrava-Karvina mining district produced 88.5 percent of the country's black coal in 1987. The Northern Bohemian mines at most supplied 75.3 percent of brown coal production. Over 90 percent of Czechoslovakia's brown coal is extracted through open pit mining techniques.

Czechoslovakia produced 25.3 million tonnes (mt) of coal in 1989. Production, however, has decreased since 1980 when it totaled 27.7 mt (see table 3). Three new black coal mines are being developed at Karkov, Frenstat and Slani with a planned output of 9,300 tonnes per day. It is estimated that this would be good quality coal some of which would be suitable for cooking.

Table 3.—CZECHOSLOVAK ENERGY PRODUCTION (mt)

	1981	1982	1983	1984	1985	1986	1987	1988
Black coal	27.51	27.46	26.92	26.42	26.22	25.66	25.74	25.51
Brown coal	93.10	95.50	98.88	101.08	98.63	99.13	98.35	96.36
Coke	10.32	10.57	10.34	10.30	10.24	10.09	10.59	10.59
Electricity (TWh)	73.50	74.75	76.28	78.35	80.63	84.77	85.83	87.37

Source: Statisticke prehledy.

Most of Czechoslovakia's brown coal and lignite production (75 percent) is used for electricity generation, heating and industrial

steam production. Approximately 42 percent of black coal production is used for such purposes.

Most of Czechoslovakia's coal is of poor quality and is the cause of much of the country's environmental problem. This is particularly true of brown coal which has very high sulfur and ash content. Brown coal contributes heavily to Czechoslovakia's total annual sulfur dioxide emissions of 3.1 billion tonnes.

To address the environmental consequences of coal combustion, Czechoslovakia plans to stabilize coal production at current levels by the year 2000. Brown coal utilization specifically will be targeted for reduction. The plan is to reduce brown coal production and utilization for power generation by 40 percent by the year 2000. Another part of the Czechoslovak environmental program has been aimed at the steel industry. Efforts are being made to cut back the steel production and to convert the remaining production from energy intensive open hearth methods to oxygen blown technology.

Should the Czechoslovaks succeed in stabilizing coal production by the year 2000, coal will then account for less than one-half of the country's primary energy consumption. To date, most of the coal that has been backed out of the Czech energy mix has been displaced by nuclear power. This trend may be difficult to maintain in the future given the problems with further nuclear development and the setback dealt to the Gabcivoko-Nagymaros hydroelectric project. These issues are detailed in the subsequent treatment of electric generation in Czechoslovakia.

The coal industry employs a significant portion of the Czechoslovak workforce. This fact may frustrate efforts to curtail Czechoslovak coal production. The Czechoslovak Government is attempting to address the economic and social displacement that will be caused by the shift away from coal by offering early retirement incentives and retraining for unemployed workers.

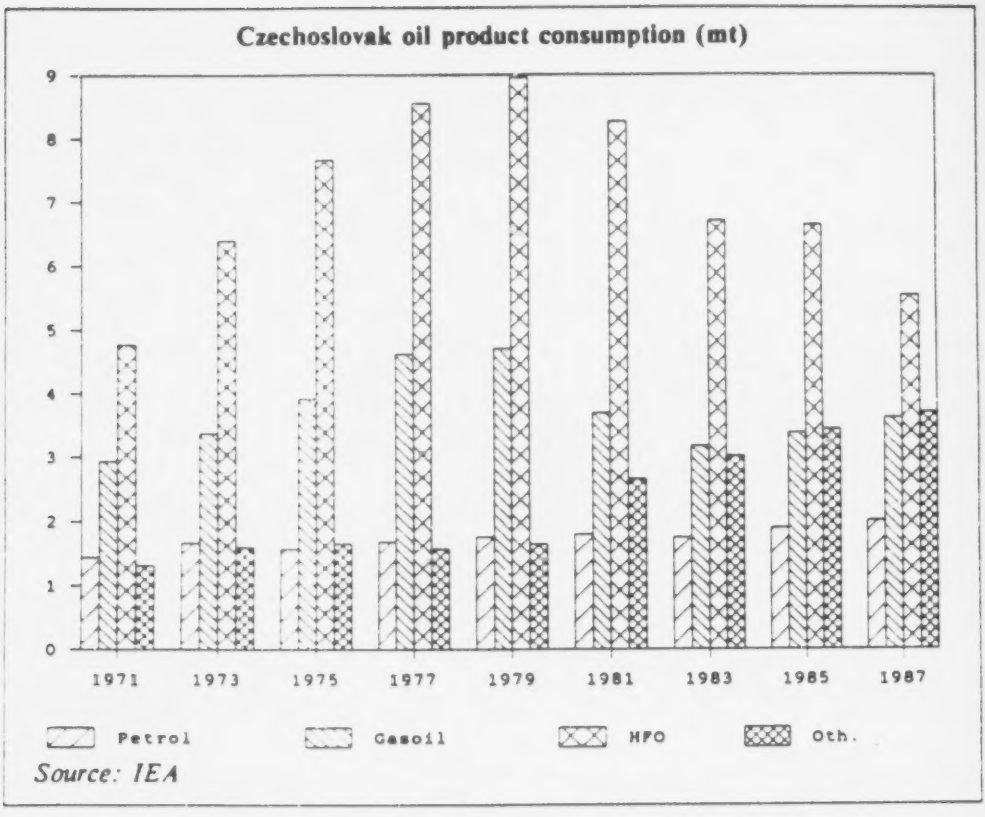
Czechoslovakia exports coal (2 mt in 1987) and lignite (2.8 mt, almost all of which goes to Germany). Due to the low Btu content of its domestic coal, Czechoslovakia imports metallurgical coal (4.9 mt in 1986, including 3.1 mt from the Soviet Union) for its steel industry for coking.

2. Oil and Gas

Historically, Czechoslovakia has been highly dependent on the CMEA for its oil imports (17.7 mt in 1987), and has been most dependent on the Soviet Union (17.4 mt or 99 percent of its imports). (There are 7.33 barrels of oil per metric ton.) The Czechoslovak Government's initial response to cutbacks in Soviet oil supplies was to attempt to make do with less oil and to not seek replacement supplies outside the CMEA (see chart 4). This policy resulted in the underutilization of Czechoslovak refining capacity.

While the protocol between Moscow and Prague for 1990 set oil deliveries at 16.6 mt, the year's actual total will be around 12.8 mt, short of the target by 3.8 mt. At the end of 1990, Czechoslovakia and the Soviet Union agreed that the Soviet Union will guarantee deliveries of only 7.5 mt of crude oil to Czechoslovakia in 1991. (This represents little more than half of the anticipated supply of 13 mt.) Furthermore, continued Soviet oil supplies have been conditioned upon the receipt of payment in hard currency. Any increase

Chart 4



in Soviet oil supplies above the level set by the protocol would have to be negotiated directly with the individual Soviet Republics.

In a shift in policy, Czechoslovakia has begun to seek oil supplies to replace the lost Soviet oil. Czechoslovak officials are already working on new accords with Russia, the Ukraine, and Uzbekistan. Czechoslovakia may possibly receive an additional 1.5 mt of Soviet oil in exchange for equipment. It is also negotiating a barter deal with Iran, in order to acquire 3 to 6 mt of oil per year, on a long-term contract.

As with oil, almost all of Czechoslovakia's natural gas needs are met through imports from the Soviet Union. These imports have increased steadily over the years, from 8.3 billion cubic meters (bncm) in 1980 to 12 bncm in 1988. Natural gas imports are planned to increase to 18 bncm in 2000. At that point, natural gas would represent approximately 23 percent of Czechoslovakia's primary energy consumption.

Czechoslovakia currently produces only enough natural gas to meet 10 percent of domestic demand. There exists, however, the po-

tential for increased domestic production, although the reservoirs are very deep (5,000 to 6,000 meters).

D. ENERGY UTILIZATION IN CZECHOSLOVAKIA

1. Electric Generation

In 1987, installed electric generating capacity in Czechoslovakia totaled 21,688 megawatts (MW), with the bulk of the generating capacity being coal fired (see table 4). A further breakdown is as follows: (1) 15,000 MW thermal capacity: (2) 3500 MW nuclear capacity; and (3) over 3,000 MW hydroelectric capacity.

Table 4.—CZECHOSLOVAKIA'S MAJOR POWER STATIONS

	Capacity (MW)	Start-up
Thermal		
Vojany I	6 x 110	1967
Prunerov	6 x 110	1969
Pocerady I	4 x 200	1972
Tusimice II	4 x 200	1977
Pocerady II	2 x 200	1978
Melnik III	1 x 500	1981
Nuclear		
Jaslovsky-Bohunice V-1	2 x 440	1979
Jaslovsky-Bohunice V-2	2 x 440	1985
Dukovany	4 x 440	1986
Mochovce	4 x 440	[1] 1992
Temelin	4 x 1,000	[1] 1996
Kecerovce	2 x 1,000	[1] 2000

[1] Estimated.

Source: Hospodarski noviny.

Czechoslovakia meets its electricity needs almost entirely through domestic generation, with some power imported from the Soviet Union to meet short-term surges in electric demand. In December 1988, Czechoslovakia reached an agreement to establish a direct current power grid with the former West Germany in order to have access to supplemental power supplies from the West and to have the potential to export electric power if there is a surplus. Construction of a 400 KW transmission line was begun in 1990 and will be completed in 3 years.

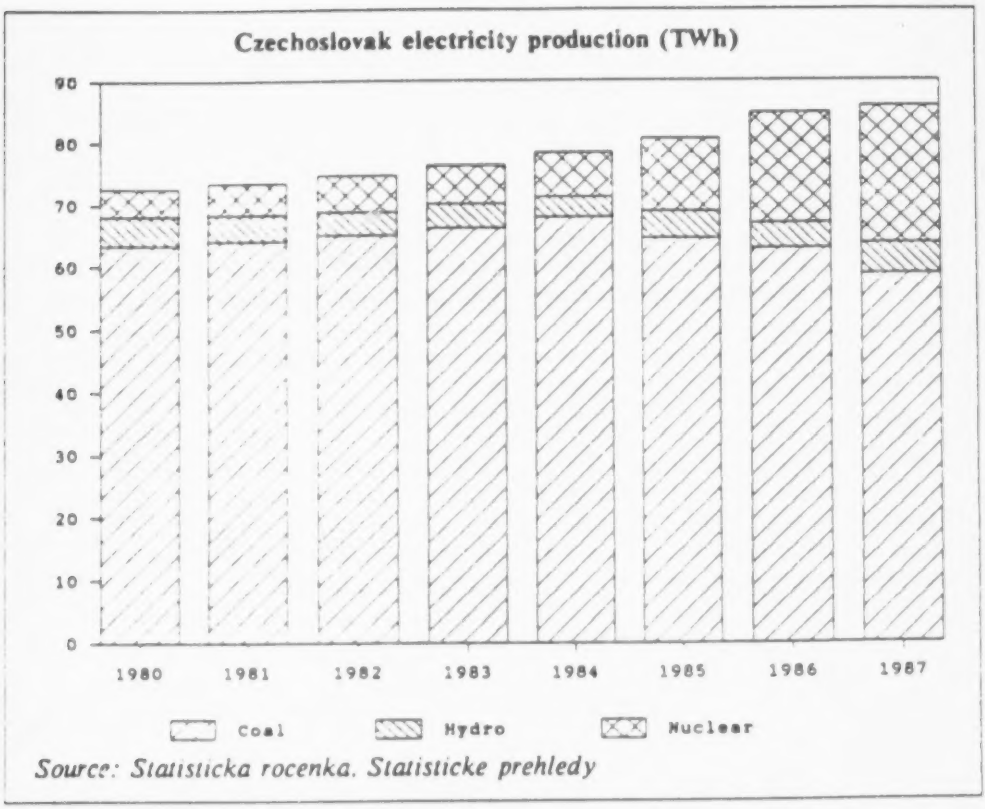
Czechoslovakia's electricity production is distributed as shown in chart 5.

The electricity sector is controlled by the Department of Fuels and Energy which is part of the Ministry of Economy. The Czechoslovak nuclear program is administered by the Atomic Energy Commission.

a. Hydroelectric Capacity

Further development of Czechoslovakia's hydroelectric capacity was frustrated in 1990. In May 1990, Hungary decided to withdraw from the joint construction with Czechoslovakia of the Gabcikovo-Nagymaros Dam. This project would have provided 2.65 TWh per year of electrical energy for Czechoslovakia from the Gabcikovo

Chart 5



Source: Statisticka rocenka. Statisticke prehledy

section. Hungary's decision to cancel its participation in the project was in response to public objections on environmental grounds.

With Hungary's withdrawal from the project, Czechoslovakia will be forced to utilize its own dam and generating station at well below design capacity. Budapest has conceded that it will have to compensate Czechoslovakia for this deficit.

b. Nuclear Power

Czechoslovakia undertook a massive shift to nuclear energy as an alternative to coal. Nuclear power expanded the fastest of all energy sectors in the 1980's. Nuclear power's share of primary electricity consumption grew from 2.8 percent in 1980 to 8.8 percent in 1987 and is expected to grow to 26 percent by the year 2000.

Czechoslovakia currently has two 440 MW nuclear reactors at Jaslovske Bohunice V1, two reactors at Jalovske Bohunice V2, and four reactors at Dukovany. All of the reactors are the Soviet VVER type.

Czechoslovakia's objective is to have 11,280 MW of nuclear capacity installed by the year 2000. Two Czech nuclear plants currently are under construction: (1) four 440 MW reactors at Mochovce; and (2) two 1000 MW at Temelin based on the VVER design. The first two units at Temelin, started in 1987, will begin operating trials in 1992 and 1994. The completion of two more 1,000 MW reactors at Temelin has been postponed for financial reasons. Czechoslovakia is negotiating with Western companies for the construction of another new nuclear plant. Czechoslovakia's reactors are produced by the Skoda concern in Plzen. Skoda is a Czechoslovakian company composed of two enterprises: the car manufacturing company located in Mlada-Boleslav, and the heavy manufacturing company (turbines, locomotives, nuclear reactors) in Plzen.

The Czechoslovak nuclear program is not without controversy. Germany reports that the Temelin plant is being built on a site with geological faults. Austria also strongly objects to the Temelin plant, as well as to Jalovske Bohunice. Austria has demanded that the Bohunice plant be closed, because of lack of reliable safety systems. Austria recently offered to provide free electricity as an inducement for Prague to shut down the Bohunice plant.

There are 11 uranium mines and 3 yellowcake units (fuel processing facilities) in Czechoslovakia. Because Czechoslovak production costs are much higher than world prices, and the Czechoslovak Government has decided to shut down nine of the mines and two of the yellowcake units.

2. Natural Gas

The share Czechoslovak energy consumption accounted for by natural gas has increased from 3.5 percent in 1970 to 11.9 percent in 1987.

Natural gas is used primarily for district heating and residential applications. While natural gas consumption is metered, the rates charged consumers are heavily subsidized. Electric power generation could account for a significant increase in natural gas consumption in Czechoslovakia. Czech authorities expect natural gas consumption to increase from 14 bncm to 18.4 bncm by 1995, and 25 bncm by 2005.

There exist serious doubts about the Soviet Union's ability to meet Czechoslovakia' growing demand for natural gas. Other potential suppliers could be Algeria, Iran, Norway, and the Netherlands.

Czechoslovakia has been a major transporter of natural gas since 1972. It has constructed a 30,000 kilometer long pipeline network within its borders for transporting Soviet gas to Germany, Austria, Italy, France and Yugoslavia. Czechoslovakia earns considerable income as a natural gas transporter. The Soviet Union supplied 5 bncm of natural gas in 1988, as payment for the transport of gas to West and South European buyers.

3. Industrial Energy Consumption

Czechoslovakia's industrial sector accounts for 52 percent of the country's primary energy consumption (1986) and consumes 78.6 percent of the electricity generated in Czechoslovakia. Czechoslovakia's heavily industrialized economy is the primary reason for the

country's high energy intensity. Czechoslovakia has one of the highest energy intensities of the CMEA; its per capita energy consumption ranks just behind Rumania, Bulgaria and the Soviet Union (see table 2).

The trend during the 1970's and up through the late 1980's has been toward increased energy intensity in the Czechoslovak economy. This was a direct result of the priority that Czechoslovakia placed on the development of its iron and steel and petrochemical industries during the 1970's.

Beginning in 1980 the Czechoslovak Government tried to rationalize energy consumption by: (1) limiting the growth of highly energy intensive industries; and (2) introducing energy consumption standards and controls. By 1984, one out of two companies ignored the energy conservation standards, as the achievement of production goals set by the Government under its economic plan took clear precedence over energy saving. The Czechoslovak experience in the early 1980's is typical of the limits of an energy conservation policy implemented in a Communist country.

Recent reductions in Soviet oil deliveries have taken their toll on the Czechoslovak steel industry. At the expense of other industries, the petrochemical industry has been given priority access to limited oil supplies.

III. Czechoslovakia's Economic and Financial Situation

The dismantling Czechoslovakia's centrally planned economy is less advanced than in Poland or Hungary. The new economic leaders belong to the former State apparatus elite, which explains their cautious approach of free market reforms. It does appear, however, that Czechoslovakia is willing to take affirmative steps toward the privatization of its economy.

While Czechoslovakia has significant economic structural imbalances, its monetary and financial policy has always been very conservative. Czechoslovakia's external debt of $5 billion represents only 4 percent of the country's GNP. The inflation rate is estimated to be 4 percent. Czechoslovakia has a higher gross domestic product than Poland and Hungary, and its budget deficit has always been limited. (In the 1990 budget it was limited to 1 percent of GDP.) Czechoslovakia's growth rate was negative in 1989 (−3.5 percent) and 1990 (−2 percent) and some economists expect it to remain negative in 1991.

Its well developed industrial sector makes Czechoslovakia attractive to foreign investors. Japan appears to be making Czechoslovakia one pole of its Eastern European strategy. The Germans and Austrians also have been very active investors in Czechoslovakia.

A. PRIVATIZATION

The privatization of the Czechoslovak economy will be administered by the Office of Temporary Administration of State Property. Two main issues must be addressed in the privatization process: (1) whether to compensate prior owners of the property taken by the Communists; and (2) whether to privatize the Communist Party's extensive properties, accumulated over the years, and if so whether do so without compensation to the party.

The Czechoslovak banking system has been privatized. In addition to the Central Bank and two savings banks that already existed, two agricultural banks and three commercial banks (Czech and Slovak credit banks and an investment bank) were created in 1990. One problem, freely admitted by the bankers, is the absence of fundamental banking knowledge. The legal reform of the Czechoslovak banking system must still be implemented at the business level. In an important step, Czechoslovakia is revamping its accounting system along the lines of the French model. A World Bank loan will help to facilitate the implementation of the banking reforms.

The legal framework for doing business in Czechoslovakia is still evolving. Joint-venture laws are being developed. In 1991 the Parliament will consider amendments that would, among other provisions, permit 100 percent profit repatriation. Three significant business laws were enacted in 1990:

1. The Joint Stock Companies Act

Because joint stock companies had been virtually liquidated under the Communist regime, it was necessary to enact the Joint Stock Companies Act as part of the larger legislative program aimed at making private enterprises possible. This law prohibits state dissolution of joint-stock companies; such companies may be dissolved only by resolutions adopted at company board meetings. This joint stock company law does not contain express provisions authorizing foreign nationals to participate in Czech joint stock companies.

2. The Amended Act on the Enterprise With Foreign Property Participation

This law expressly authorized foreign participation in Czechoslovak joint stock companies. Its main provisions are as follows: (1) joint ventures may be established in all areas of the economy with the exception of those which are necessary for national defense and security; (2) both Czechoslovaks and foreigners are entitled to establish joint venture corporations or to participate to existing ones; (3) foreign companies may hold 100 percent of the shares of joint stock company; and (4) the formation of joint stock companies must be authorized by the Federal Ministry of Finance, in agreement with the Republican Ministry of Finance (Czech or Slovak).

Under the law, the tax treatment of joint stock companies will be as follows: (1) the income tax rate will be 20 percent unless income exceeds 200,000 Cz. crowns, in which case a 40 percent tax rate applies; (2) the tax rate on the volume of wages paid by the joint venture company will be 50 percent, except that in certain sectors of the economy such as services the rate will be 20 percent; and (3) joint stock company dividends paid to a foreigner will be taxed at a 25 percent rate except in cases where another rate applies under a treaty that Czechoslovakia has negotiated with another country.

In addition, 30 percent of the foreign exchange earned by a joint stock company must be offered for purchase by the State. Under the law, repatriation of profits is permitted only when there is sufficient liquidity in foreign exchange. It is likely that this provision will be amended in 1991 to permit the repatriation of 100 percent of profits.

3. The Act on Economic Relations With Foreign Countries

This law outlines the range of possible economic activities with foreign countries. In most cases, all that is required is for a business combination to register or receive authorization from Czechoslovak authorities. Under this law, the Czechoslovak oil sector will continue to be centralized since 99 percent of the country's oil is imported from the Soviet Union and is the subject of an intergovernmental arrangement.

The Czechoslovakian Parliament approved recently landmark legislation to end 40 years of state control over its economy, by handing over all nationalized industry to private investors. All 4,500 industrial enterprises, valued at $130 billion should be available to domestic and foreign private investors. The new law concerns the large privatization, the small one being done through direct sales and auctions, and will permit the sale of most healthy ventures to foreign investors. Companies illegally nationalized by Communists after 1948 will be returned to original owners or their descendants. The remaining enterprises will be made available to other Czechoslovaks through an intricate system of government issued coupons, as well as to foreign investors.

4. Reorganization of the Oil and Gas Sector

Czechoslovakia's natural gas industry currently is controlled by the Department of Fuels and Energy which is the agency that administers all sectors of the country's energy industry. The legal and financial details associated with reorganizing the country's oil and gas sector remain to be worked out. The country's oil and gas industry employs approximately 30,000 people.

The current thinking is to reorganize the country's oil and gas sector by creating separate Czech and Slovak oil and gas enterprises. The present plan is for the country's natural gas transportation enterprise, called Transgas, to be restructured as a limited company with partial private participation.

B. FOREIGN ASSISTANCE

At the time this report went to press, the World Bank was negotiating with the Czechoslovakian Government for a series of loans to facilitate the reorganization and modernize its economy. The loan package being negotiated would include an energy loan, a technical assistance loan and a structural adjustment loan (SAL). Because these loans have not yet been approved, the amounts and exact purposes references in the following discussion should be considered approximate.

The $400 million SAL would be cofinanced by Japan, which would loan Czechoslovakia an additional $200 million. The SAL would help Czechoslovakia to deregulate its economy, liberalize its pricing policies (over 2 to 3 years), and help utilities initiate cost-based rate structures.

The energy loan would total between $200 million and $300 million. The loan would be focused on the natural gas (storage and domestic transmission) and electric power generation sectors (marginal cost study).

Another loan of between $50 million and $75 million finance technical assistance in the following areas: (1) restructuring the coal, gas, oil, and electricity sectors; (2) nuclear reactor decommissioning studies; (3) energy conservation projects including insulation demonstration projects in residential and industrial buildings; (4) restructuring Transgas, the international gas pipeline company; and (5) diversification of the country's oil and gas supplies.

The SAL and technical assistance loan also will include initiatives for other sectors of the economy. A financial loan of between $150 million and $250 million may be made for purposes of bolstering Czechoslovakia's banking system and studying the creation of financial markets.

The World Bank loans should be available, if agreed upon, within 6 months. The energy loan, which is at the project appraisal stage, should be available within 1 year.

IV. Conclusion

Under current conditions, Czechoslovakia along with Hungary offers greater opportunities for foreign investors than do their neighboring countries in Eastern Europe.

Japan has focused on Czechoslovakia as part of its Eastern European industrial strategy. In contrast, Hungary, because of its traditional cultural links with Germany, has attracted massive German investments.

Czechoslovakia's biggest advantage over its Eastern European neighbors lies in its sound financial situation and low external debt level (4 percent of GNP). In comparison the external debts of Hungary and Poland represent 62 percent and 56 percent of their respective GNP's.

Although Czechoslovakia first steps toward free market economic reforms were tentative, it recently has become more decisive about implementing its privatization program and opening its economy to foreign investors.

The reorganization of the Czechoslovak oil and gas sector and the restructuring of Transgas, Czechoslovakia's natural gas transportation enterprise, are major projects that remain to be worked out.

Although Czechoslovakia is heavily industrialized, one of its biggest challenges lies in the modernization of its obsolete industry as well as its reorientation toward less energy intensive industries.

The Czechoslovak Parliament will likely be debating energy policy options this spring. Because of ethnic problems developing in the Slovak Republic, the debate will be very complex and political as it involves the Federal Ministry of Economy as well as the Czech and Slovak Ministries of Economy, which are responsible for the energy policy implementation.

The trend in Czechoslovak energy policy has been to expand the nuclear sector and to substitute natural gas for coal on account of environmental concerns. This trend may be difficult to maintain because popular opposition to nuclear energy likely will gain momentum, especially since Germany has recommended that all Soviet designed nuclear reactors built in former East Germany be shut down for safety reasons.

Czechoslovakia's financial constraints will be aggravated by the Soviet Union's request for hard currency payment for its oil and gas exports. In this regard, energy conservation programs and a rationalization of Czechoslovakia's pricing structure will be an important part of its national energy policy.

CHAPTER III. HUNGARY

Executive Summary

Hungary is a small country and has limited natural resources: bauxite and natural gas, some coal, oil and uranium.

Hungary was an agricultural country that has built an industry encouraged through market-oriented economic reforms introduced since 1968 into its economic planning. Hungary has benefited from 20 years of reformist evolution and is the most advanced of Eastern European countries in free market economic reforms.

Hungary has a more balanced energy mix, in comparison to other Eastern European countries, and seems better placed to face the energy sector challenges; its energy consumption is relatively diversified with coal and lignite representing 26.4 percent, oil 29.7 percent, natural gas 28.2 percent and electricity 15.7 percent.

Still, some 50 percent of Hungary's national energy consumption is imported, and 95 percent of its annual energy imports come from the Soviet Union.

Hungary imports 50 percent of its natural gas needs, 25 percent of its electricity and 90 percent of its oil imports from the Soviet Union. It produces half of its natural gas needs, 25 percent of its oil and 90 percent of its coal consumption.

Although Hungary has reserves of oil, gas, coal and uranium, it appears to have exploited the most easily available deposits and has serious restructuring and cost problems.

Hungary promoted in the 1970's an energy conservation program based on planned standards and controls and financial mechanisms. Further progress in energy efficiency will depend greatly on structural changes of the industrial sector and modernization of the Hungarian economy. The Hungarian Government should also initiate by 1992–1993 environmental actions supported by the World Bank loans.

The Soviet Union may not be able to meet all Hungary's oil needs and OPEC oil supplies may be needed. Hungary has decided to end its state monopoly on oil imports and is looking to private oil and gasoline imports this year.

Sizable natural gas was discovered in the 1960's and promoted the rapid development of piped gas supply. There are currently problems in maintaining the current level of natural gas production which is expected to drop by year 2000. Major investments are needed, and it will be necessary to diversify the pipeline system and join the Western European network.

There are massive proven workable coal reserves in Hungary. Since the late 1970's, coal mines have been producing less coal at increasingly greater cost. Modern equipment and sometimes basic machinery are needed. The Hungarian Government has enacted a

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new coal pricing scheme law in order to put domestic prices at more realistic level.

The nuclear option in Hungary was put on hold since the 1989 upheavals, and there is growing public opposition to the expansion of the Paks nuclear power station. However, in 1988, nuclear power represented 38.4 percent of total electricity generation, and may be one option for the construction of two new 900 MW baseload units. Gas fired turbines are another alternative source of electricity that the Hungarian authorities wish to develop.

Hungary has the lowest energy intensity of all Eastern European countries, since its industrial sector represents only 36 percent of its final energy consumption.

Hungary is the most advanced of Eastern European countries in its move toward privatization. It has ended at the beginning of this year its state monopoly on oil imports. The OKGT (Hungarian oil and gas company) is being denationalized, and the electricity industry will be restructured.

The World Bank is working on project loans related to energy, environment and conservation, as well as loans concerning all sectors of the economy.

Although Hungary has a foreign debt representing 62 percent of GNP, it has always kept up with its interest payments and did not have its debt rescheduled. Thus, despite its high debt, Hungary has already attracted Western investors. Germany has been the most active.

Budapest
GAS
OIL
GAS
URANIUM
OIL
GAS
CMEA Crude Oil Pipeline
Hard Coal
Brown Coal

HUNGARY

I. Background

Hungary's population of 10.8 million represents only 8.1 percent of the Eastern European population. Hungary comprises 7.5 percent of the total Eastern European land area. It has a strategic location for north-south and east-west energy trade (figure 1). Hungary has limited natural resources: bauxite and natural gas, some coal, oil, and uranium.

Hungary was still an agricultural country in 1945. Since then, it has built an industry mainly based on mechanical construction, electromechanics, commercial vehicles, pharmaceutical products, furniture, paper, and food products.

The first attempts to introduce market-oriented mechanisms into economic planning and to develop trade with Western countries occurred in 1968. These developments took place in the framework of a political system that remained centralized, because the Hungarian Communist Party had reformist views.

In 1988, the Communist regime itself was put in question by its reformist members, and in October 1989, Hungary ceased to be a "People's Republic". Since then, reformist Communists progressively lost the population's support, and the new "Democratic Forum" won the March–April 1990 elections.

Hungary has benefited from 20 years of reformist evolution, earning the reputation of a "laboratory country", that makes it the most advanced of Eastern European countries in market oriented reforms.

Hungary is still very highly indebted, and although it has tried to diversify its international trade, more than 50 percent of its trade is still with the Council for Mutual Economic Assistance. Hungary needs to modernize its economy and develop its trade with the Western Countries, which will help it get the hard currencies needed to pay its international debt.

Hungary seems to be better placed than other Eastern European countries to face the energy sector challenges, because it already has a balanced energy mix, more in line with Western European countries.

II. An Energy Profile of Hungary

A. HUNGARY'S ENERGY MIX

Compared to Czechoslovakia, and Poland, Hungary's energy consumption is relatively diversified.

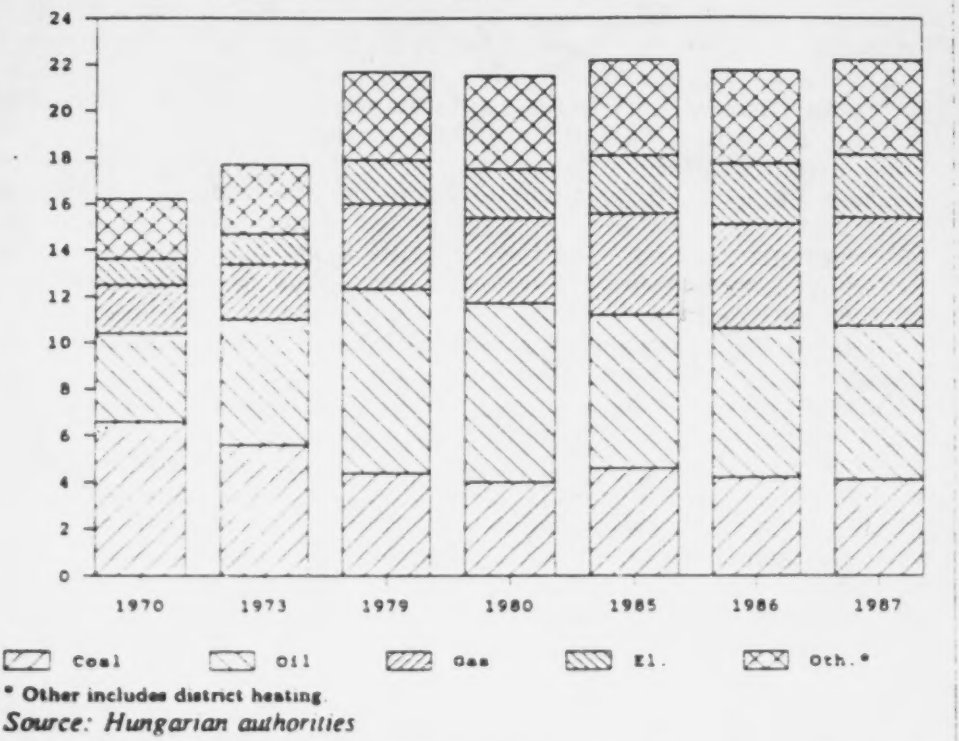
In 1987, coal and lignite represented 26.4 percent; oil, 29.7 percent; gas, 28.2 percent; and electricity, 15.7 percent (see further for electricity sources of production).

Hydrocarbons still represent a strong percentage (58 percent) of the energy mix, although Soviet oil imports decreased since 1982. Gas was then partly substituted to oil (see chart 6).

B. HUNGARY'S ENERGY POLICY

Hungary was the first Socialist country to diversify its energy supply. The degree of diversification however, has been minor compared to Western European countries.

Chart 6



Source: Hungarian authorities

Hungary gets 95 percent of its annual energy imports from the Soviet Union.

Some 50 percent of Hungary's national energy consumption is imported, and may increase to 60–70 percent by the year 2000.

Hungary produces half of its natural gas needs and imports the rest (6.3 bncm) from the Soviet Union. It also produces 90 percent of its coal consumption (22.8 mt in 1987) and imports the rest (2.5 mt). Hungary also imports 25 percent of its electricity (10.5 TWh) and 90 percent of its oil imports (6.5 mt) from the Soviet Union. Hungary produces 1.9 mt of its oil.

Although the pollution problem in Hungary is not as dramatic as in Czechoslovakia and Poland, there is some concern over environmental issues. This is still a sector where a complete policy needs to be developed. The environmental division of the World Bank has issued a report to the Hungarian Government that should initiate by 1992–1993 environmental actions supported by the World Bank loans.

As Hungary imports 50 percent of its energy needs, energy saving as well as a better economic management is of great importance for the Hungarian economy.

Hungary promoted in the 1970's an energy conservation program through two different sets of measures: planned standards imposed on each company and controls (typical of the socialist systems), and financial mechanisms. These latter included two types of measures:

The pricing reform of 1979 linked domestic prices to international prices and provoked large prices increases. Recently energy prices subsidies have been partially eliminated.

Financial incentives were given to finance energy conservation investments or thermal insulation in housing (30 billion forints—Hungarian currency—to subsidize energy saving investment projects over the past 10 years). The best results of the program were in oil use: 43 percent of the energy demand was satisfied by oil in 1978, versus 30 percent in 1988. Lately, Government conservation programs have fallen back considerably due to the lack of funds.

Further progress in energy efficiency will depend greatly on structural changes of the industrial sector and modernization of the economy. Foreign technical and financial help will be needed in that sector, and especially private investment will be welcome.

The World Bank gave Hungary two loans in 1989–1990: a structural adjustment loan of $200 million and a sectoral adjustment loan also of $200 million. One of the conditions for the loans included some coal mines closing, and the encouragement of light industries with good export records in order to reduce the percentage of heavy industries.

In 1991, there will be a large public debate in Hungary that might be brought to the Hungarian Parliament on the global energy policy, the conservation programs, the increase of domestic energy sources, and the role of the state in the private sector.

C. HUNGARY'S ENERGY RESOURCES

Although Hungary has reserves of oil, gas, coal, uranium, it appears to have exploited the most easily available deposits. It now has serious restructuring and cost problems.

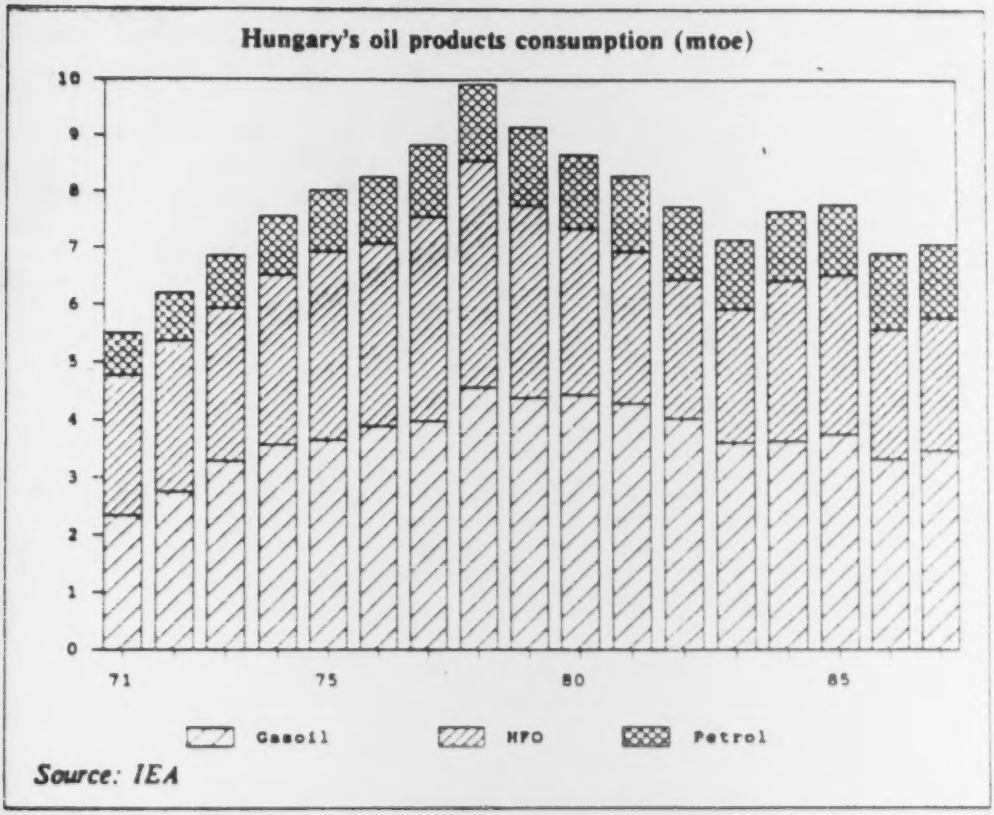
1. Oil

Oil reserves are not extensive (70 mt in 1989). There are doubts as to whether Hungary will be able to maintain its oil production of around 1.9 mt per year.

Oil production units are running on inefficient technologies, and production is diminishing. According to OKGT, Hungary's national oil and gas trust, if current production techniques are used, by year 2000, output would have shrunk to one-tenth of current levels (see chart 7). It seems that there are opportunities for oil production and exploration equipment and new technologies.

Domestic oil production accounts for a quarter of Hungary's needs (1.9 mt out of 8.65 mt in 1988). Most of the rest is imported from the Soviet Union under bilateral trade agreements. In 1989–1990, Soviet imports have been negotiated at about 6.5 mt/year, and paid in transferable rubles. The latest indication from the

Chart 7



Source: IEA

Soviet Union is that it was unable to deliver the contracted 6.5 mt of crude in 1990, and there was a shortage of 1.5 mt. The new 5-year agreement covering 1991-1995 will switch to accounting based on more hard currencies. The deal still includes some barter since the Soviet Union received equipment from Hungary that was not completely paid for.

Nevertheless, since the existing pipeline offers the cheapest form of delivery, OPEC oil imports would be 10 percent more expensive, even when Soviet oil prices follow world rates.

The Soviet Union may not be able to meet all Hungary's oil needs of 7.5 mt by 1995 and 9 mt by 2000, and OPEC oil supplies may be needed. Hungary has decided to end its state monopoly on oil imports and looks to private oil and gasoline imports this year, as the U.S.S.R. reduces crude deliveries to only 20,000b/d from 130,000b/d for 1990, and 90,000b/d expected. It has also let market forces set gasoline prices since January 1st: the decision came after taxi and truck drivers paralyzed traffic for 3 days to protest drastic prices hikes. The Government then halved a 65 percent price increase of gasoline until a free market could take effect.

OKGT also signed on January 8, a contract with Nawa Ltd (a Hungarian private firm that makes spot purchases), to buy 100,000 mt of Saudi light crude at $23.90/bbl. The deal is part of a larger arrangement between Nawa and the Saudis (supply of up to 4 mt of crude for each of the next 3 years, at $21.50/bbl). The crude is to arrive through the Adriatic pipeline in February, OKGT will pay the importer in forints.

An Iranian delegation is expected in Hungary, by mid-February to discuss a possible long-term, 2 to 2.5 mt crude supply deal. Iran is also considering having oil refined in Hungarian refineries under some sort of commission arrangement.

The exiled Government of Kuwait may soon conclude its first Eastern European oil deal, a joint venture between Kuwait Petroleum Corp and OKGT, to build 15 to 20 gasoline stations. The deal could involve investments in upgrading the 150,000 barrel a day Szazhalombatta refinery (installation of equipment to produce unleaded gasoline and low sulfur fuel oil).

2. Natural Gas

Sizable natural gas deposits were discovered in the 1960's and promoted the rapid development of piped gas supply. Reserve levels are estimated at 130bncm, but there are problems in maintaining the current level of production (6bncm) which is expected to drop to 4.2bncm/year by 2000. There are significant deposits of poor quality gas (partly inflammable) which have not been exploited: one plant using modern enrichment processes is under construction near Tazlar. The World Bank is also financing a study on utilization of the inert gas.

In 1989, the World Bank gave a $100 million loan for Hungary's oil and gas exploration (see further with OKGT restructuring).

There is growing domestic gas demand. Of the 3.5 million households, 940,000 are connected to natural gas supply, and 60,000 to 80,000 are being connected each year. The gas demand is growing also in power generation sector. Domestic consumption is expected to reach 15bncm/year by 1995, but there is as yet a shortfall of 3.5bncm/year in supply contracts (see table 5).

Table 5.—KEY DATA FOR HUNGARY'S GAS SECTOR

	1982	1983	1984	1985	1986	1987
Natural gas sales (mcm)	10,129	10,114	10,482	10,804	11,289	11,473
By distributors	2,700	2,835	3,203	3,575	3,831	4,350
To residences	458	437	553	639	782	1,053
Town gas sales (mcm)	508	427	419	345	229	166
By distributors	65	50	51	43	22	
To residences	38	33	33	27	16	
LPG sales (kt)	285	294	318	318	307	310
To residences	254	258	282	312	280	283
No. of piped gas consumers	1,025	1,074	1,143	1,218	1,313	1,418
Residences	1,001	1,048	1,104	1,182	1,272	1,375
Also for heating	505	541	581	650	714	835

Source: OKGT.

The Hungarian Government is negotiating with the Algerians, the Czechoslovakians and Austrians, over transit arrangements.

The Government has defined the major investments needed and consider it as a priority to establish a link to the European gas system. Commitments on the transit of gas to Yugoslavia require the construction of pipelines and compressor stations. Pipelines and compressor stations are needed to supply the Transdanubian region. A further pipeline is needed between Baja and Pecs.

The Ministry of Industry said that Hungary will not immediately be able to replace Soviet gas imports with Western ones. The most important problem will be to diversify the pipeline system and join the Western European network.

3. Coal

There are massive proven workable coal reserves (6bnt, including 2.5bnt lignite), enough to satisfy demand probably for well over 100 years. But since the late 1970's, coal mines have been producing less coal at increasingly greater cost, and increasing depth.

This situation has necessitated increasing subsidies over the years (8 billion forint in 1980), to such an extent that the World Bank required that the subsidies be cut back sharply and coal mining become financially self supporting, as one of the conditions for a sectoral adjustment loan.

As a result, state aid was reduced to 2.7 billion forints in 1989, and to 0.8 billion forints in 1990. State investment funds were cut from 3.2 billion forints to 1.5 billion in 1990. A new pricing scheme law was enacted: coal domestic prices were put at international level for the power industry and based on imported fuel oil prices. Subsidies will be completely removed for household coal prices by mid-1991, and the prices will be based on imported coal prices, which will result in a doubling of the prices.

The Hungarian Government wants to close unprofitable coal mines and only keep opened the ones that are profitable.

The Ministry of Industry controls the eight coal mine enterprises: coking coal is produced by the Mecsek coal mines, brown coal by Dorog, Tatabanya, Veszprem, Borsod, and Nograd.

There is a chronic need in the coal fields for modern equipment, and even for basic machinery in some cases.

The Hungarian authorities have identified the principal needs for coal technology: a harmony between drift driving and stripping, more uniform mechanized safety systems, machine oriented work organization technology for working and ripping machine lines.

The development of the hard coal field (Mecsek) has been affected by a governmental decision not to expand the national iron and steel industry.

The Government intends to compensate for the resulting shortfall in coal production by importing coal from former East Germany or from the West. This may prove difficult since most of the 2000MW of coal-fired plants are fitted to utilize domestic coal.

There are also moves to replace some of the coal with lignite, for power stations, which would be less expensive.

The coal import needs for year 2000 would reach 3.5 mt.

4. Nuclear energy

Since the upheavals of 1989, the nuclear option was put on hold, and since Chernobyl, there is growing public opposition to the expansion of the existing nuclear power station of Paks.

Plans for the construction of two further 1,000MW VVER units at Paks had been agreed between the Soviet Union and Hungary in 1986, but the Hungarian Government suspended the orders in 1989.

Negotiations are being conducted with Western countries: Italy and Germany are working with Framatome, the French nuclear reactor builder, and Electricite de France, on a project that might lead to the building of two 900MW nuclear plants, financed by sales of electricity to Italy and Germany (see further electricity sector).

Fuel for Paks is supplied by the Soviet Union from Hungarian produced yellowcake enriched. Similar bilateral agreements with other COMECON partners cover the return of spent fuel to the Soviet Union after 5 years' storage at the nuclear plant site.

Hungary's uranium mine at Mecsek is to be closed since the production prices of yellowcake (processed fuel) are far above the competitive world rates. Ultimately, the mines may be used as waste storage site. This project is under discussion with foreign potential joint-venture partners from Germany, Austria, Canada, Japan.

D. ENERGY UTILIZATION IN HUNGARY

1. Electricity generation

The total capacity was 6,872MW at the end of 1988, including 4 nuclear reactors of 440MW in the nuclear plant of Paks.

The percentage of the different energy sources in power generation is the following:

1988: lignite, 9.7 percent; coal, 25.3 percent; oil, 7.1 percent; natural gas, 19.5 percent; and nuclear, 38.4 percent.

Table 6.—HUNGARY'S MAIN POWER STATIONS

	Fuel	No. of units	Power capacity (MW)	1987 power output (GWh)	1987 heat supply (TJ)
Alka	coal	6	126	703	4,878
Borsod	coal	9	171	998	5,366
Budapest	oil and gas	16	131	672	18,809
Dunamenti	oil and gas	13	1,870	4,436	7,420
Gagarin	lignite	5	800	3,199	301
November 7	coal	5	100	418	1,008
November 7 gt	gas	2	170	19	
Oroszieny	coal	4	210	841	404
Paks	nuclear	8	1,760	10,985	688
Pecs	coal	6	229	1,020	4,230
Banhida	coal	1	100	655	117
Tiszapalkonya	coal	7	235	1,239	3,100
Tisze II	oil and gas	4	860	3,109	

Source: Hungarian Statistical Yearbook.

Hungarian electricity is bought, sold, and distributed by the Hungarian electricity board (MVMT). The board has a number of

affiliated companies, one of which is the headquarters of the trust and works as a producing company.

The majority of electricity generation takes place in and around Budapest, in the Northeast and Transdanubian regions. It is negligible in the Southeast region.

There is a project for the construction of new baseload units (two 900 MW units, cost $1 billion). The decision will be made between coal, lignite, or nuclear energy.

It seems that Hungary would want to switch toward gas fired turbines, extension to existing power stations (reconstruction of cogeneration power stations in order to replace them with combined cogeneration-gas fired stations) and a greater reliance on energy savings.

There are projects to add 380MW gas turbine capacity to the Danube power station and 480MW to other plants by 1997, and a further 200MW should be available following the reconstruction of the coal fired units that include the Gagarin and Oroszlany power stations, and has been partly funded by the World Bank.

The use of coal fired electricity is expected to fall to 19 percent by year 2000, the use of oil and gas is expected to rise respectively to 31 percent and 34 percent in total electricity generation.

A slow rise in total capacity is expected to be between 1.3 percent and 1.5 percent per year by year 2000.

Electricity imports from the Soviet Union rose rapidly in the 1980's, and represented one fourth of the country's 40 TWh needs. The Soviet Union has been unable to maintain the contracted level of electricity imports to Hungary that had to import more power from Yugoslavia and former East Germany. There is a firm contract from the Soviet Union for 1100MW/year from 1991 to 2000, any additional imports would have to be negotiated on a 3 month basis contract (see chart 8).

The domestic consumption increased by 4 percent in 1988, while electricity consumption declined by 2 percent in industrial use. Total electricity consumption rose by 3 percent in 1989, from 40.2 TWh in 1988. Paks provided 13.9 TWh.

After months of intense negotiations, in 1989, Hungary decided to suspend indefinitely further construction work on the Nagymaros Dam project that is the vital part of the giant Czechoslovakian-Hungarian Gabcikovo-Nagymaros hydroelectric scheme. This decision will seriously affect output at Czechoslovakia's Gabcikovo generating facilities.

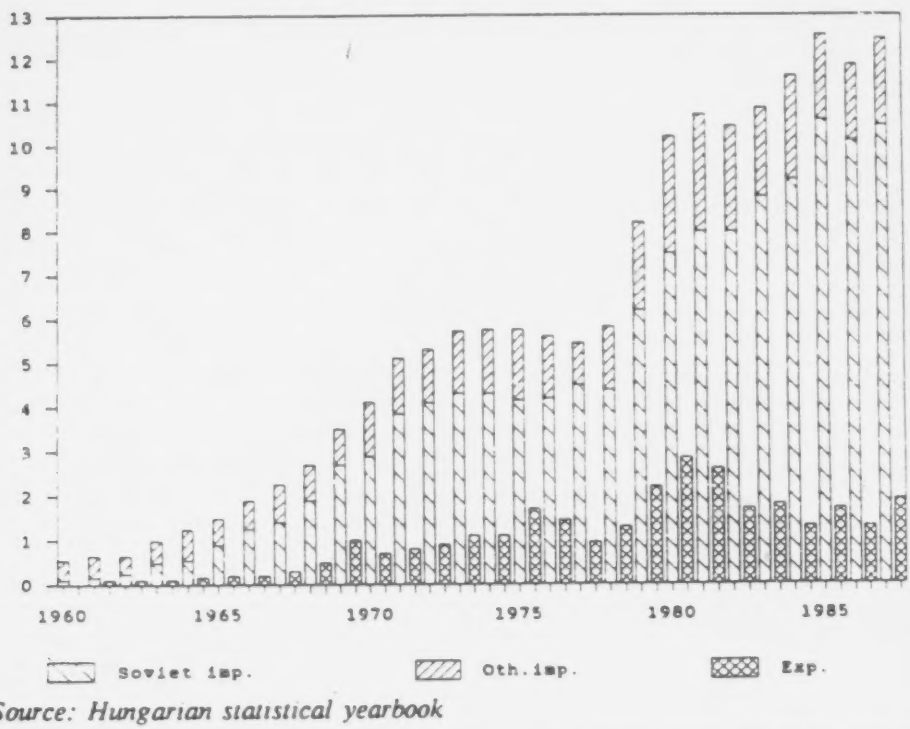
Hungary is likely to pay enormous compensation costs, as the Austrians who were involved in the financing and building at the Nagymaros may claim $400 million, and the Czechoslovakians $1.5 billion.

Renewable and alternative energy is not widely used in Hungary, but the Government intends to increase the use of waste heat, and use renewable natural resources as additional energy, such as natural water springs. Geothermal energy provides 200,000toe per year, biomass 100,000toe.

2. Industrial energy consumption

Hungary has the lowest energy intensity of all the Eastern European countries. The industrial sector represents only 36 percent of

Chart 8



Source: Hungarian statistical yearbook

the final energy consumption, while the residential tertiary (commerce, services), agricultural sector represent 45 percent. The Hungarian industry is characterized by a high proportion of light industries, although the iron and steel industry was strongly developed in the 1960's (table 2).

III. Hungary's Economic and Financial Situation

According to the financial and economic experts of the World Bank, although Hungary is highly indebted (foreign debt of $20 billion, 62 percent of GNP), and will have to pay in 1990 $1.4 billion in interests and $1.7 billion in principal, it seems as of today's conditions, that it will be able to go through the next 18 months that should be the hardest ones.

The economic program negotiated with the IMF was implemented in 1990: the budget deficit was to be reduced by 9.915 billion forints ($170 million) through large reductions of state subsidies and public expenses.

The inflation is still high (28 percent) but it is mainly explained by the voluntary price increases of energy and other products.

Hungary should be able to get new money from the World Bank and the EEC, as it had always kept up with its interest payments and did not have its debt rescheduled.

In 1983–1986 and in 1989, a $250 million loan in total was given for energy development (gas and oil development and exploration, power plants rehabilitation). A $125 million loan was related to energy conservation investments. A structural adjustment loan for $200 million was concerning macro economic reforms.

A. PRIVATIZATION AND DEREGULATION

Hungary is the most advanced of the Eastern European countries in its move toward privatization: it has a new banking system, security laws, a stock exchange market.

Early in February 1968, Hungary had set up a series of reforms with the "new economic mechanism", giving more independence to the economic agents, but always in the framework of political centralism. This relative liberalization was possible as it came from the Hungarian Communist Party's reformist view.

Thus Hungary could benefit in the long term (despite a kind of stop and go economic evolution), from the positive impacts of these programs. In contrast, in Czechoslovakia, which had initiated in 1968 the most advanced economic reforms at the initiative of the intellectuals of the Communist Party, the repression of the "Prague Spring" and the normalization imposed by Soviet forces was systematic, and dismantled completely the previously undertaken reforms.

1. The reorganization of several energy related sectors

The oil supply has been deregulated. Since January 1991, Hungary has ended its state monopoly on oil imports, any Hungarian or foreign company can arrange any business for oil imports.

The OKGT (the Hungarian oil and gas company) is being denationalized. There may be a joint venture in farm-in where the production would belong to the foreign investors, and the ownership would remain Hungarian. The company may be split into several operating companies. OKGT plans to go into trading, international exploration and production. The denationalization of OKGT should be finalized by the end of June. The Hungarian Government is studying the possibility of selling Hungarian oil refineries.

The electricity industry will be restructured. It is currently under the control of MVMT, a state-owned company, that controls all production and distribution. The issue is whether to use the EDF model with a strong central management (EDF is the French public utility that has the monopoly for electricity distribution, but not for generation; it is under the control of the Ministry of Industry, but does not receive subsidies, and it can make profits although it is not free to fix its own prices and has to consult with the Ministry of Industry), or to move to an Austrian-German type of system with each powerplant under a different management, and connected with different distribution companies under supply contracts.

2. The general business climate

The general rules seem to be favorable to foreign investors. There are no restrictions on foreign investments, as long as they represent a minority participation. A majority participation would require the Hungarian Government's approval.

Profit repatriation is totally free. Moreover, only 30 percent of foreign participation in a company is required to benefit from the tax benefits (starting with 5 years of tax exemption, and then a reduction on tax rates the following years). The Hungarian Government intends to reduce the taxes from 50 percent to 40 percent of GDP.

Because of the former reforms, 75 percent of the state-owned companies are already decentralized, with an autonomous self-management.

In 1989, two laws were enacted:

The law on economic associations which confers to economic entities the right to choose between various forms of ownership, non-profit organization, corporation, shareholders' company, etc. . . .

The law on foreign investments that considers private any entity with at least 30 percent of foreign capital.

In 1990, the law on the State Privatization Agency created that Agency to control the fairness and transparency of the deal.

At present Hungary is going through the administrative process of refining the implementation of these privatization laws.

Two more laws are to be examined:

The law on cooperatives and their transformation into companies,

The privatization of land, with some compensation for the former owners.

As of today, 90 percent of the productive assets are still public, only 10 percent is private because of the lack of capital, and the low level of domestic savings.

The contentious issue of evaluating the public assets has been settled by the creation of the State Privatization Agency.

The current system as a whole, according to the World Bank's country officer on Hungary, seems to be fair and to work well: in 1990, half a billion dollars of foreign investments were made in total, compared to $400 million in 1989.

B. FOREIGN ASSISTANCE

The World Bank staff is currently working on an energy-environment project that would include among other actions desulfurization on coal power stations (total project cost: $250 million, loan: $125 million). There will also be an Energy Development and Conservation project loan that will include conservation investments ($25 million line of credit) and gas development (unknown amount of loan), and an energy conservation loan for $25 million as well as an Energy loan ($62 million) concerning the rehabilitation of the power sector (reconstruction of cogeneration power stations to be replaced by combined cogeneration and gas turbine power stations).

The World Bank is also negotiating at the present time a program of loans that would amount to $1 billion for a period of 3

years starting mid 1991–1992. It would concern all sectors of the economy. One project may involve the development of power supply capacities. Another SAL is also under preparation.

IV. Conclusion

Hungary, despite its high debt, keeps a flow of economic activity. Although its growth rate is expected to be negative in the next 2 years (which would reduce Hungary's energy needs), the World Bank's Financial Analyst expects it to be around plus 2.5 percent in 1993.

Its open and long time reformist economy has already attracted Western European investors, mainly Germany that encourages investments through tax incentives and very low interest loans to German companies. Austria and Italy are also being very active.

Although Hungary presents a more balanced energy mix, it needs to invest into more modern equipment and technologies.

The relatively lower share of coal in its energy consumption makes its environmental problem less dramatic than in other Eastern European countries.

Energy conservation is likely to play an important role in Hungary's future energy policy, as Hungary covers only 50 percent of its energy needs through domestic production.

The denationalization of OKGT, that plans to go into trading, international exploration and production, and the restructuring of the Electricity industry are major projects that will be implemented this year.

A large public debate will be held this year in Hungary, that may be brought to the Hungarian Parliament and will cover the global energy policy, conservation aspects of the program, the increase of domestic energy sources, and the role of the state in the public sector.

CHAPTER IV. POLAND

Executive Summary

Poland is the largest country in Eastern Europe and has abundant natural resources, including coal, copper and sulphur. Poland's main economic burden is its very heavy external debt, which represents 56 percent of GNP.

Coal dominates Poland's energy mix. Coal accounted for 70 percent of Poland's primary energy consumption in 1986 and, together with lignite, fueled 90 percent of the country's electricity generation. Oil accounted for 13 percent of Poland's energy mix and natural gas accounted for 7.6 percent.

The goal of Polish energy policy is to reshape the country's energy balance by reducing its dependence on coal and increasing oil and natural gas consumption. In the long term, Poland may reconsider the nuclear option.

In the early 1980's Poland embarked on an energy conservation initiative. The program's goals were only partly accomplished. The longer term solution for inefficient energy utilization will be for Poland to modernize its industry and implement market pricing reforms.

Given the importance of coal in the domestic economy and as an export commodity, Poland's dependence on coal is unlikely to diminish much before the turn of the century. Poland's coal industry currently finds itself caught between rising production costs and lagging commodity prices. Restructuring the coal industry will have painful social consequences. In order for Poland to continue its heavy reliance on coal, pollution control and Western clean coal technology will have to be a priority.

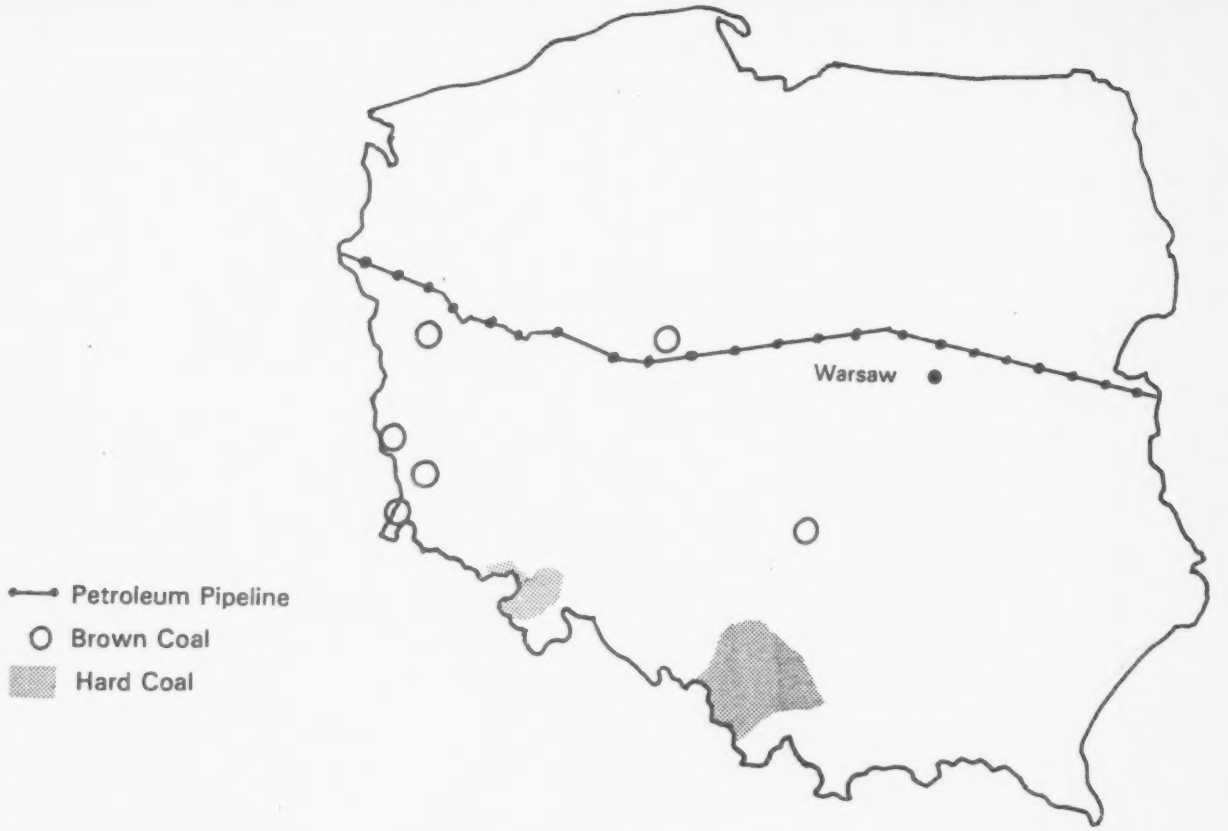
Poland imports nearly 100 percent of its oil, with 93 percent coming from the Soviet Union. Imports of Soviet oil have declined since the early 1980's, and increased shortfalls in Soviet oil deliveries occurred in 1990. In 1991 all of Poland's purchases of crude oil will be negotiated at world market prices. While Poland has virtually no domestic oil production, Western companies have shown interest in oil and gas exploration in Poland.

Natural gas is Poland's second largest domestic energy resource and remains largely untapped due to a shortage of investment funds and inadequate incentives for exploration and development. The World Bank has financed a major study intended to identify ways to develop Poland's natural gas resource base. Expanding Poland's gas market will require large capital investments for the development of a natural gas distribution infrastructure and significantly higher commodity prices for residential and commercial natural gas consumers. Currently, Poland's industrial sector is the only one that is paying natural gas prices in line with import costs.

The energy sector will be among the last sectors of Poland's economy to be privatized. The privatization of Poland's economy is moving on two tracks: (i) what is called the "small privatization" for commerce and transportation; and (ii) what is called the "big privatization" for industry. The "big privatization" will be accomplished in two steps. First, state enterprises will be corporatized into stockholding companies. Second, the corporatized state enterprises will be privatized.

Poland has undertaken drastic economic reforms since 1989 in an effort to balance the budget, reduce subsidies to industries and consumers, free prices and freeze wages in order to accelerate the transition to a free market economy. As part of the transformation to a free market economy, Poland has begun to reform its legal system. A law enacted in 1988 recognized the right of free market economy and eliminated legal monopolies.

In June of 1990 the Polish Government signed an energy loan with the World Bank. The loan will finance studies of Poland's energy sector, including an implementation plan for the phased restructuring of Poland's natural gas industry and the coal and power/lignite district heating industries. A World Bank delegation recently traveled to Poland to assist the Ministry of Industry in implementing a privatization program.



POLAND

I. Background

Apart from the Soviet Union, Poland is the largest country in Eastern Europe and is about the size of the State of New Mexico. Poland has 37.8 million inhabitants (27.7 percent of Eastern Europe's population); its population is 95 percent Catholic. Poland has abundant natural resources including coal, copper, and sulphur.

Poland resisted the imposition of communism and collectivization almost from the start. This explains why 80 percent of the land is held as private property. Poland has an agricultural tradition and 30 percent of the population remain involved in agriculture. During the years of Communist rule, the Catholic Church was a countervailing political and social force.

The political and economic changes in Poland were the product of a popular movement that developed in connection with Solidarity. After beginning as a labor union in the late 1970's, Solidarity has evolved into something more akin to a political party. Solidarity was the victor in the legislative elections of June 1989.

Poland is burdened with very heavy external debt ($39 billion in 1989, 75 percent of which is public). While the debt has been restructured, its enormity undermines Poland's ability to borrow for the modernization of its economy.

In December 1989 the Polish Parliament enacted a comprehensive economic reform program. This program involved drastic initiatives to accelerate the transition to a free market economy. Poland's energy sector has yet to be privatized. A World Bank delegation visited Poland in March 1991 to assist the Polish Ministry of Industry in implementing an energy privatization program.

II. An Energy Profile of Poland

A. Poland's energy mix

Poland's energy mix is dominated by coal (see table 7). In 1986 coal represented 70 percent of Poland's primary energy consumption (with brown coal accounting for 15 percent of total coal consumption). Oil accounted for 13 percent of primary energy consumption and natural gas 7.6 percent.

B. Poland's energy policy

The goal of Polish energy policy is to reshape the country's energy balance by reducing its dependence on coal and increasing the share of primary energy consumption represented by oil and natural gas. In the long term, Poland may consider the nuclear option.

Jurisdiction over energy policy in Poland is organized as follows. The Ministry of Environmental Protection will be in charge of oil and gas exploration only. The Ministry of Finance will be responsible for fixing energy prices and providing funds to state energy enterprises. Municipal authorities will be delegated a larger role in the energy sector (district heating systems, local distribution of gas and electricity). The Ministry of Industry has been charged with developing a program for revitalizing the energy sector.

Table 7.—POLAND'S PRIMARY ENERGY SUPPLY (PJ)

	1973	1979	1980	1984	1985	1986	1987
Production							
Coal	4,217	5,126	4,853	4,913	4,940	5,000	5,057
Oil	16	13	13	7	8	6	6
Gas	203	223	190	167	173	157	157
Hydro	13	16	21	13	17	14	15
Other	44	31	35	51	54	83	82
Total	4,493	5,409	5,112	5,151	5,192	5,260	5,317
Imports							
Coal	34	27	29	30	30	34	32
Oil	467	697	686	572	575	588	590
Oil products	115	141	170	150	144	150	140
Gas	58	135	180	204	203	240	253
Electricity	18	43	38	43	51	73	97
Total	692	1,043	1,103	999	1,003	1,085	1,112
Exports							
Coal	1,129	1,194	887	1,181	1,001	926	833
Oil products	51	59	67	20	16	14	18
Electricity	35	47	41	86	70	72	81
Total	1,215	1,300	995	1,287	1,087	1,012	932

Source: Polish authorities.

In the early 1980's Poland recognized the importance of energy conservation. An energy conservation policy was adopted in response to a slump in domestic coal production. The first phase of the conservation program included a shift in the technology used in cement plants, shutting down obsolete furnaces, the introduction of automatic thermostats, improving electric powerplant efficiency, and the recovery of waste energy. The program's second phase emphasized industrial restructuring in favor of energy efficient industries.

The energy conservation program produced some results. Poland began producing fluidized bed combustion boilers and a new generation of electric motors, new types of building materials replaced metals, and small scale hydroelectric facilities were built. Industry shifted to the production of less energy intensive products. Steel production declined and the production of electronics and products requiring precision engineering increased.

The energy conservation program was not a total success. Industrial energy intensity declined by 5.5 percent, as opposed to the expected 8.8 percent. According to the World Bank, Poland's energy consumption per unit of NMP (Net Material Product) improved by less than 10 percent compared to its level in 1970. Thus the potential for energy savings remains immense.

The longer term solution is to modernize Polish industry to bring it in line with Western Europe. According to the World Bank, the market pricing of energy together with a program of energy audits at the plant level could contribute greatly to improved energy efficiency.

C. POLAND'S ENERGY RESOURCES

1. Coal

During the post World War II period, Poland developed a reputation as an energy rich country based on its immense reserves of good quality black coal. Today this reputation would appear to be an anachronism.

In 1987, Poland accounted for 6 percent of the world's hard coal production. It was the world's fourth largest hard coal producer (behind China, the United States and the Soviet Union) and the world's third largest coal exporter (behind the United States and South Africa).

Polish coal production first slumped in 1981 (from 193 mt to 163 mt). Production has stagnated since then and coal exports have decreased. In 1988 Poland exported 31.8 mt of coal (including 9.5 mt to the EEC and 14.3 mt to CMEA countries other than the Soviet Union), which represents a sharp drop compared with exports of 34.7 mt in 1986 and 36.2 mt in 1985 (see chart 9). While mining productivity remains high, the exhaustion of easily extracted coal reserves and the need to direct investments to other sectors of the economy points to a continued decline in coal production in the years ahead.

Given its importance to the domestic economy and its value as an export commodity, Poland's dependence on coal is unlikely to diminish much before the turn of the century. In 1987, 482,500 workers, or almost 11 percent of Poland's workforce, were employed in the coal mining industry. While coal has declined sharply in recent years as a source of hard currency, it still represented 12 percent of Poland's exports outside the CMEA in 1987 (see table 8).

Poland's proven hard coal reserves are located primarily in the Upper Silesian Basin (which accounts for 98 percent of output), the Lower Silesian Basin, and the Lublin Basin.

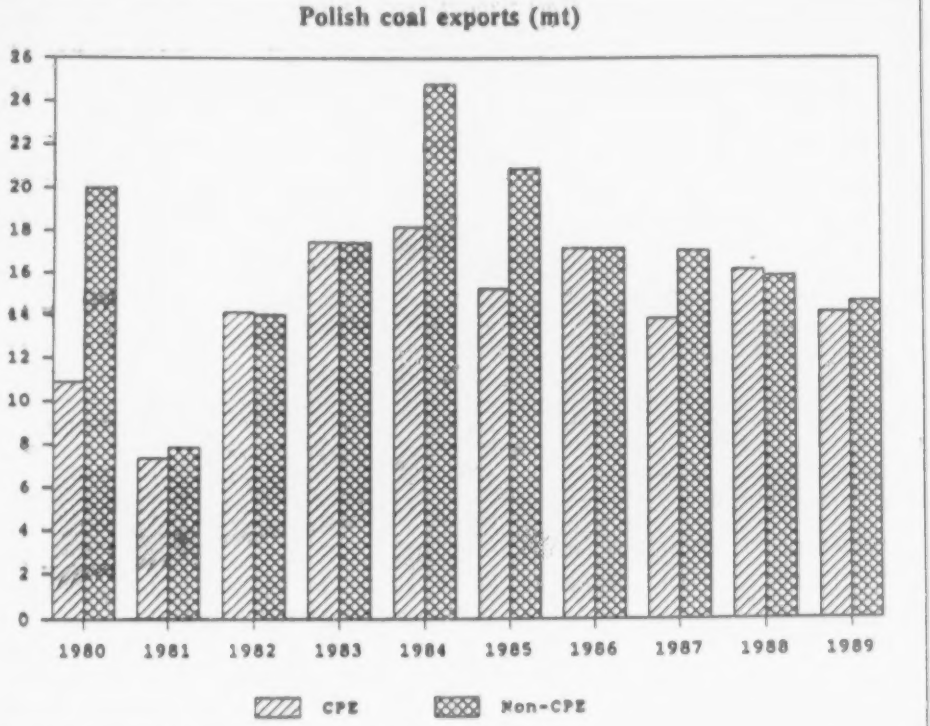
Poland's coal mining industry is caught in a squeeze between rising production costs and lagging commodity prices. The problem will be compounded by the withdrawal of longstanding government subsidies. It remains to be seen how far and how quickly the Polish coal industry can be economically rationalized given the social costs this is likely to entail. The plan is to demonopolize the industry and, possibly, to privatize it.

Restructuring Poland's coal industry will be painful, particularly in Lower Silesia. The Lower Silesian Basin has the highest production costs of Poland's coal producing regions and is likely to be hit hardest by any production cutbacks. Coal mining employs 20,000 workers in the region and there are few alternative employment opportunities.

Poland's dependence on coal has had serious environmental consequences. Poland's per capita sulphur emissions are three times higher than the average for the rest of Europe.

Even with some reduction in output, coal will remain a major part of Poland's energy economy. Consequently, pollution control will have to be a priority. Better coal cleaning and the installation of emissions controls at electric powerplants will have to be part of the program. Western clean coal technology and financial aid also will be necessary parts of the program.

Chart 9



Source: Rocznik Statystyczny, Rzeczpospolita

2. Oil

In 1986 oil represented only 13 percent of Poland's energy mix. This was the lowest in Europe and reflects Poland' heavy reliance on coal and the scarcity of automobiles in the country.

Poland has virtually no domestic oil production (only 100,000 tons per year). Consequently, Poland imports nearly 100 percent of its oil, almost all of which had come from the Soviet Union (93 percent in 1987).

Between 1980 and 1987 Poland's oil imports declined by 17 percent (from 20.8 mt to 17.3 mt). Following cutbacks in Soviet oil exports, Poland could not afford to replace the lost supplies with imports from OPEC or elsewhere. This resulted in energy shortages and the introduction of rationing in 1982. It also caused much of Poland's refining capacity to be underutilized.

In 1990 further shortfalls occurred in Soviet oil deliveries. The Soviets defaulted on about 4.035 mt out of the scheduled 10.73 mt of deliveries. Beginning in 1991, all of Poland's purchases of crude oil will be negotiated at world market prices, using official zloty/dollar exchange rates.

Table 8.—POLISH HARD COAL EXPORTS (mt)

	1986	1987	1988	1989
CPE				
Albania	52	78	64	94
Bulgaria	27	20		
Czechoslovakia	1,680	1,149	1,677	1,398
Yugoslavia	495	266	171	215
East Germany	638	605	621	602
Romania	1,940	1,717	1,312	1,363
Hungary	644	515	668	568
Soviet Union	1,689	9,578	11,725	9,950
Total	17,167	13,929	16,238	14,191
EEC				
Belgium	410	430	518	293
Denmark	1,561	2,103	1,658	835
France	262	560	247	406
Spain	338	411	259	150
Netherlands	552	786	789	790
Ireland	695	662	722	581
Portugal	120	35	70	32
West Germany and West Berlin	2,663	2,208	2,008	1,808
Italy	996	1,274	846	789
UK	1,262	1,057	1,278	1,270
Total	8,808	9,530	8,397	6,955
Other European Countries				
Austria	1,648	1,911	1,846	1,719
Finland	2,380	1,983	2,038	2,599
Norway	144	122	125	25
Switzerland	160	226	123	174
Sweden	1,052	889	976	174
Total	5,384	5,161	5,108	5,276
Non-European Countries				
Algeria	101	201	153	147
Argentina	322	235	121	152
Brazil	2,234	1,942	1,959	1,645
India	351	.....	136	371
Iran	.....	.....	59	120
Tunisia	.....	.....	3	3
Uruguay	1	1		
Total	3,009	2,379	2,431	2,430

Source: Weglokoks.

Oil and gas exploration in Poland is under the control of the state-owned oil and gas company. Offshore exploration in the Baltic Sea is at an uncertain stage. Estimated Baltic Sea reserves are 3.8 mt. While oil was found at Bialograd at very deep level (3,800 m) in 1989, according to the World Bank, this does not appear to be a major oil field.

Western companies have shown interest oil and gas exploration in Poland. Amoco signed a 1 year agreement in the summer 1989 to form a joint venture for survey drilling. In addition, a Soviet, Polish, East German consortium called Petrobaltic is looking for Western partners to take up to 40 percent of the company's stock.

There are plans to modify a refinery in the south of Poland (the Poludnie refinery and petrochemical complex). The project will cost $700 million and will process 6 mt per year of crude oil. A consorti-

um of U.S. companies called Petropol is involved in financing the project.

3. Natural Gas

Natural gas is Poland's second largest domestic energy resource and remains largely untapped due to a shortage of investment funds and inadequate incentives for exploration and development. The World Bank has financed studies intended to identify ways to develop Poland's natural gas resource base (see further discussion under Privatization).

Poland's proven "dry gas" reserves are estimated at 155.2 mtoe (World Bank 1987). Currently, natural gas exploration is occurring in three regions: (1) the Carpathian Mountains; (2) the Carpathian foothills; and (3) the Polish Depression. Poland's domestic natural gas production peaked in the late 1970's at 8 bncm per year and represented 50 percent of the country's gas consumption. As domestic production declined, Soviet natural gas imports increased to fill the gap.

An expansion of Poland's natural gas imports was made possible in the 1980's with the completion of the western end of the Kobrin, Brest, Warsaw pipeline. The pipeline made possible a 1.45 bncm (or 25 percent) increase in Soviet gas shipments to Poland between 1985 and 1987.

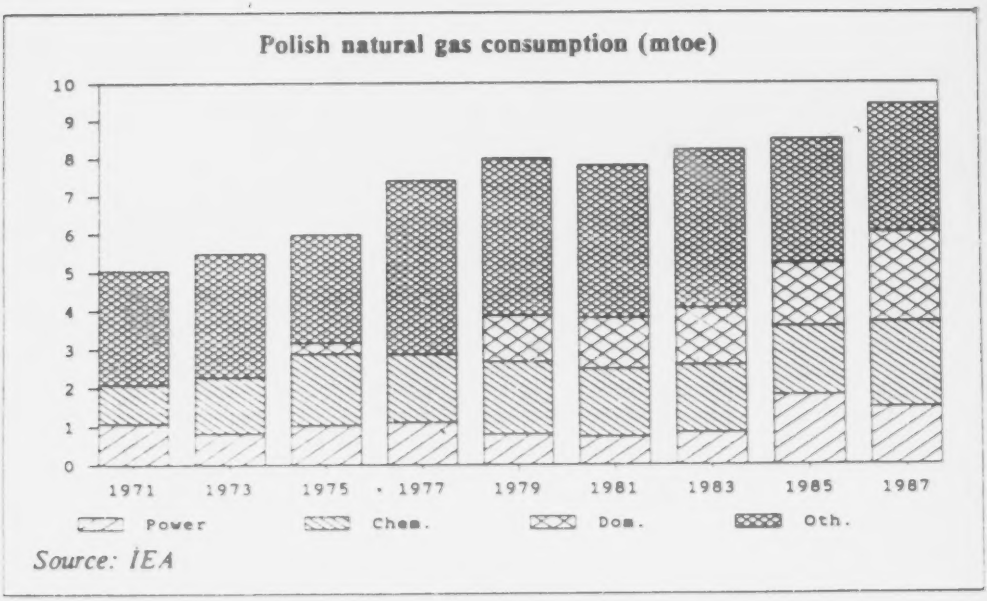
The natural gas share of Poland's energy mix has increased slowly since 1970 (from 5.9 percent in 1970 to 7.6 percent in 1986). Industry accounts for 70 percent of the natural gas consumed in Poland; the rest is consumed by the residential and commercial sectors. Five-and-one-half million residences in Poland are connected to public gas supplies. Natural gas also is used as a process fuel for industry, for electric power generation, and as a chemical feedstock (see chart 10).

Over the next few years, the Polish Government would like to double gas use to 15 percent of total energy consumption. These increases would occur mainly in the residential sector and in power generation. This would be accomplished by increasing domestic production and by obtaining gas supplies from the North Sea, from Algeria in the form of liquefied natural gas (LNG), or from the Soviet Union as the result of renegotiated import agreements.

Poland is negotiating with the Soviets for an increase in its 5-year quota from 40 bncm to 51 bncm between 1991 and 1995. Poland claims that it is entitled to a higher quota because its contribution to the Yamburg pipeline project, which will bring gas from Urals to the Polish border, ended up greater than determined in 1987.

Expanding Poland's gas market will require big investments, the development of a new infrastructure to deliver gas supply, and sharply increasing prices. It remains to be seen whether gas supplies will be available at prices acceptable to the Polish economy. Government regulation has held domestic gas prices far below the cost of domestic production and international prices. Even after a fivefold increase in January 1990, retail natural gas prices in Poland remained below cost-based prices. Only Poland's industrial sector is paying a more realistic price in line with import costs.

Chart 10



Source: IEA

4. Nuclear energy

There is currently no nuclear power in Poland. Two nuclear plants under construction at Posnan and Gdansk were first postponed and then abandoned. In the early 1980's Poland embarked on an ambitious program to construct 7,860 MW of nuclear capacity. Construction delays, intense public opposition, and the country's financial difficulties all contributed to freeze the program. In view of projected electricity demand growth that will occur in the first decade of the new century, Poland might find itself compelled to reconsider the nuclear option. The financial commitment and public opinion could be important factors in any such reconsideration.

D. ENERGY UTILIZATION IN POLAND

1. Electric generation

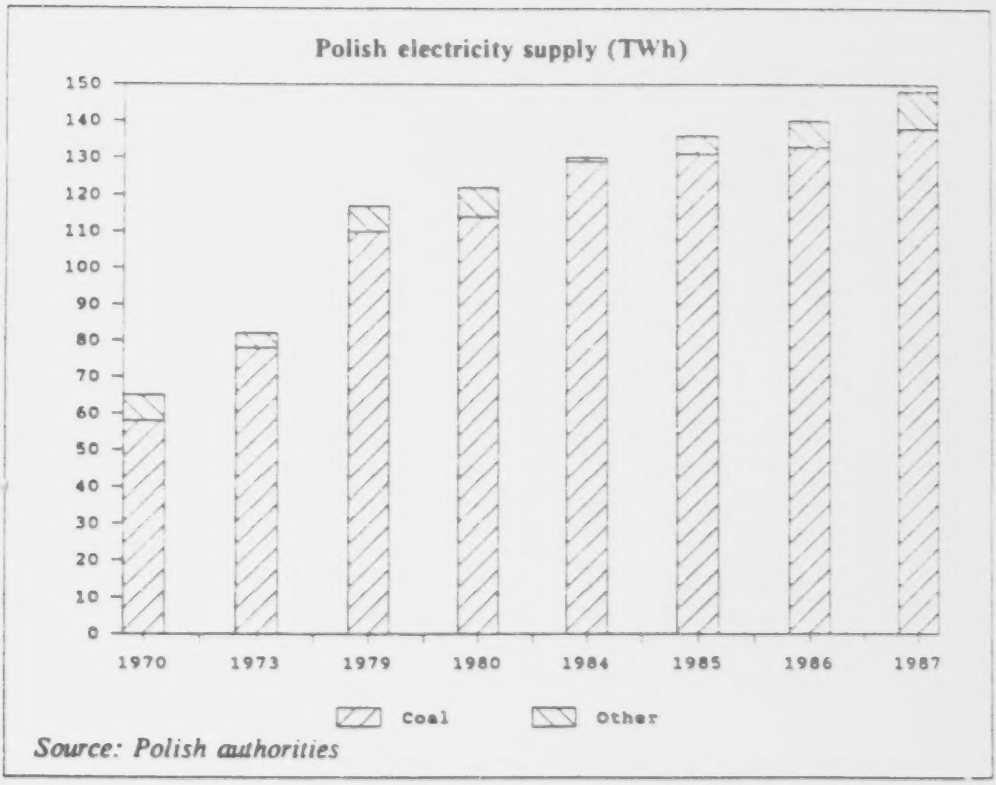
Until early 1990, Poland's electric industry was under the jurisdiction of the Union of Brown Coal and Power (WEWB). This was a state-owned concern comprised of 108 enterprises. Following WEWB's liquidation, the Ministry of Industry assumed jurisdiction over the electric industry. The industry now is organized as follows: (1) the Polish Electricity Transmission Company operates the main transmission grid: (2) there are 28 power generation enterprises and 33 electricity distribution enterprises; (3) there are 4 lignite mining companies; and (4) over 40 miscellaneous enterprises engaged in ancillary activities. The system remains highly decentral-

ized and may not be very efficient. A study commissioned by the he World Bank may recommend greater concentration.

Poland's total electric generating capacity is of 32,000 MW, of which 28,000 MW are public utility powerplants, and 4,000 MW are industrial generators. While Polish engineers consider the installed capacity to be dangerously low, the electricity deficit that had been predicted for the year 2000 may not occur due to a slowdown in economic growth because of the recession.

Ninety percent of Poland's electricity is generated using coal and lignite (lignite representing 40 percent of total electricity) (see chart 11). Hydroelectric generation accounted for just 2.9 percent of total electricity in 1988, with the remainder generated using oil, gas, or wind. The Ministry of Industry estimates that Poland has considerable untapped hydroelectric potential (12 Twh of feasible hydropower only 13 percent of which has been exploited). A significant deterrent is the high capital cost of constructing hydroelectric facilities.

Chart 11



Source: Polish authorities

Poland suffers from enormous electric transmission losses (estimated to be 10 percent of production). These transmission losses are among the highest in Europe. According to the World Bank, the magnitude of the losses would justify shifting investment from generation to transmission and distribution.

Another problem for Poland is electricity pricing. Even though electric rates have risen 30 times over the past 18 months, rates would need to increase by another factor of 3 in order to cover cost and provide a reasonable return on investment. Such additional rate increases, however, would fuel inflation and could have negative social implications.

2. Industrial consumption

Poland has a high energy intensity. In 1986 Poland's industrial sector accounted for 41.9 percent of final energy consumption (compared to 36.1 percent in Hungary). Transportation accounted only for 9.5 percent of Poland's energy consumption, with the residential, commercial and agricultural sectors accounting for the remaining 46.2 percent (table 2).

III. Poland's Economic and Financial Situation

Poland is highly indebted. In 1981, Poland was (in terms of the ratio of debt to export volume) the most indebted country in the World. Its debt reached $39 billion in 1989 (56 percent of GNP). Debt service represented 71 percent of Poland's hard currency reserves in 1987. Poland's public debt has been rescheduled for several years, and its private debt, representing 25 percent of total debt, was rescheduled in January 1990. Poland's debt represents a major constraint for the country's future ability to restructure its economy.

Poland is in the midst of a recession; between September 1988 and September 1989, its gross domestic product (GDP) fell by 2 percent. Poland's annual inflation rate reached 800 percent in December 1989; the monthly inflation rates for January and February 1990 were 70 and 90 percent respectively. Despite these difficulties, Poland is likely to achieve its goal of financial stability.

In December 1989 Poland concluded an agreement with the International Monetary Fund (IMF) to implement an economic stabilization program, and received in exchange from the IMF a $710 million loan for 1990. The program included efforts to balance the budget, reduce subsidies to industry and consumers (50 percent cuts were part of the 1990 budget), establish the complete convertibility of the zloty (that went through its 32d devaluation), free prices and freeze wages.

As a consequence of the program, the coal prices increased by a factor of 5 for industrial and commercial users and by a factor of 6 for consumers. Electric rates quadrupled and natural gas rates doubled. Because the Polish Government had to take account of the social costs associated with these measures, these increases still leave Poland's price structure below the market levels.

A. PRIVATIZATION

Poland's energy sector will be among the last sectors of the country's economy to be privatized. A World Bank delegation traveled to Poland in March 1991 to assist the Ministry of Industry in implementing a privatization program.

With the Polish presidential election concluded, there is greater certainty with respect to the responsibilities of the organs of Gov-

ernment. It thus becomes easier for foreign companies and institutions to figure out who is in charge.

1. The World Bank Energy Loan:

In June 1990 the Polish Government signed an energy resource loan with the World Bank. The premise of the World Bank loan is the belief that Poland's domestic natural gas production can be increased significantly with appropriate investments in new technology and equipment. The findings of the World Bank studies, which are not yet public, provide a background for the World Bank mission to Poland in March 1991.

The World Bank studies include an environmental assessment study that will provide guidance on which projects have the greater long term environmental benefits. A gas pricing and tariff study will define the most appropriate policies that may be used in lieu of the current system in which gas prices to consumers are centrally planned and unrelated to costs. The oil and gas study will provide a detailed plan for phased implementation of the restructuring of the gas sector and of POGC (Polish oil and gas company which is responsible for final delivery of gas to consumers). The legal and contractual study will develop for Poland an internationally acceptable legal and contractual framework including a hydrocarbon law and a model contract between the state and private parties for hydrocarbons exploration and production. At the Polish Government request, the World Bank studies will provide for the training of Polish experts in the areas of joint venture negotiations and energy and gas economics. There are also two studies on the restructuring of coal and power/lignite/district heating industries.

2. Legal Reforms

Market-oriented legal reforms adopted by the Polish Governments include the following:

a. The 1990 budget partially eliminated subsidies for energy products.

b. A law adopted on December 23, 1988, recognized the right of free market activity. No authorization is required for economic activity and all companies, public and private, are treated equally for purposes of taxation and credit.

c. Poland's banking system was reorganized by laws adopted on January 31, 1989, that created a Central Bank and permitted depositors a free choice of banks. In 1990, 23 banks opened. The Government is studying the conditions for the creation of a new financial market.

d. Legal monopolies were eliminated, although some still exist on a de facto basis in the distribution system and industrial production.

The privatization of Poland's economy is moving on two tracks: the "small" and the "big" privatization. The "small" privatization effort concerns commerce and transportation and should be implemented rather quickly (50 percent of commercial should have been privatized by the end of 1990). The "big" privatization concerns industry. As a first step, state enterprises will be transformed into stockholding companies, but will remain public ("corporatization").

As a second step, these companies will be sold to the private sector ("privatization").

B. FOREIGN ASSISTANCE

Poland recently reached an agreement with the IMF on a $2 billion financial aid package that included economic restructuring credits, compensation for high oil prices and contingency payments to be made if oil prices increase above the level assumed in Poland's economic stabilization program. Poland also appealed for forgiveness from 80 percent of its foreign debt.

In a late development, in March 1991 the Western industrialized nations agreed to erase one half of Poland's debt to other governments. The move was seen as a reward for Poland's progress toward democracy and a free-market economy. The creditor nations agreed to forgive 30 percent of their loans immediately, and the other 20 percent in 3 years if Poland adheres to its reform program. The creditor nations also extended easier credit terms to Poland.

Several World Bank loan projects will be negotiated in the coming months:

a. A structural adjustment loan (SAL) of $400 million to lend additional support to the Polish Government's economic transformation program.

b. A financial institution development loan of $150 million to strengthen the banking system and develop financial instruments and markets.

c. A $300 million loan for heat supply restructuring and conservation.

d. A $200 million loan for industrial restructuring.

IV. Conclusion

Although Poland has undertaken a drastic program of economic reforms and has achieved considerable progress, its situation appears to be less favorable than that of the other two Eastern European countries examined in this report. Czechoslovakia is on a much sounder financial footing. Hungary, while it has a high debt ratio, has always kept up with its interest payments and has never had its debt rescheduled. Also, Czechoslovakia and Hungary have more advanced industrial sectors.

Poland's energy mix is highly dependent on coal and does not offer the same diversity as Hungary. Pollution control and clean coal technology will be high priorities. Poland also needs to rationalize its energy pricing system in order to encourage more rational energy consumption and a return on investment sufficient to attract outside capital. The reforms that Poland will undertake, especially in the coal mining sector, will entail social consequences that may result in difficult choices for Solidarity.

The World Bank natural gas study could produce a blueprint for Poland to increase domestic energy production dramatically. Financing and public opinion could be important factors in Poland's decision whether to restart its nuclear initiative.

•Finally, the recent decision by the Paris Club to forgive 50 percent of Poland's public debt will bring a big improvement to its financial situation and should create conditions more favorable for Poland's restructuring of its energy sector.

CHAPTER V. U.S. ASSISTANCE PROGRAMS

I. Background

The Support for East European Democracy (SEED) Act, designed to promote democracy and economic pluralism in Poland and Hungary, was enacted in 1989 and authorized funding for U.S. Government assistance including programs related to energy and environment.

Initially, the assistance programs implemented by the various Federal agencies lacked coordination. This problem has been remedied through an interagency coordination effort under the State Department, with the Agency for International Development (AID) funding. Thus, the Department of Energy (DOE) is implementing its Eastern European energy program through the Environmental and Energy Assistance program funded through AID.

In 1991, the Department of Commerce (DOC) created the American Business Initiative (ABI) in order to meet individual company's specific needs in participating in the economies of Eastern Europe, especially for trade, investment, studies, financial information or assistance. Among the six ABI programs, the Capital Development Initiative is intended to promote in Eastern Europe U.S. expertise in energy production, energy conservation, pollution control.

II. The SEED Act

The U.S. assistance effort was first implemented through the SEED Act enacted in November 1989. SEED authorized $900 million to stimulate public and private sector initiatives to help Poland and Hungary develop democratic institutions through viable free market economies. Further funding of $370 million was contained in the House Foreign Operations Appropriation Bill (H.R. 5114), which was passed in the fall of 1990 (fiscal year 1991). About $65 million from these funds were authorized for energy and environment actions.

Under SEED, $10 million was appropriated to DOE for a power plant clean coal technology retrofit demonstration project in Krakow, Poland. In May 1991, a $7.7 million contract was awarded to AirPol Inc., Teeterboro, NJ, which will install the patented pollution control system on one of the 11 coal boilers that comprise the Skawina powerplant outside the city. According to DOE, the system is expected to capture as much as 98 percent of the sulphur pollutants from the boilers' gases. AirPol will use a technique called the "Thiosorbic Lime Process", which is now used in more than 20 coal fired powerplants in the United States.

An additional $20 million was authorized for other clean fossil fuel technology development projects in Krakow, and has been ap-

propriated under the Foreign Operations Appropriation Act of 1991.

One criticism of SEED has been that it leaves the implementing agencies with little funding discretion or flexibility. In 1990, the State Department took steps to improve interagency coordination by requiring that all energy and environmental projects go through an interagency review process.

III. The Interagency Coordination Effort

The Energy and Environment working group involves mainly, under the State Department coordination, DOE, the Environmental Protection Agency (EPA), AID, and the Office of Environmental Safety (OES). The Department of Commerce is also getting more involved in the process.

Due to the severe degree of environmental degradation in Eastern European countries, the U.S. environmental and energy assistance program seeks to bring about short term and concrete improvements in environmental conditions, while implementing a longer term policy of pollution prevention and remediation through economic restructuring and institution building. Furthermore, this assistance seeks to maximize the rapid introduction of cost effective energy conservation technologies that will allow environmental improvements while lowering the cost and capital requirements for fossil fuel consumption.

A. THE ENVIRONMENTAL AND ENERGY ASSISTANCE PROGRAM

Under the fiscal year 1991 Foreign Operations Appropriation Act, the Energy and Environment Working Group is developing the following program:

ENERGY ASSISTANCE TO EASTERN EUROPE

(U.S. $ millions)

Projects	FY90	FY91	Total
Poland/Power Plant Retrofit	10	.....	10
Emergency Energy	.....	10	10
Regional Energy Efficiency	.....	14	34
Krakow Clean Fossil Fuels and Energy Efficiency	.....	3-5	20
American Business Capital Development Initiative (Energy)	.....	4	n/a

Source: AID.

A brief description of some of these programs follows:

1. Emergency Energy Program

The $10 million, 1-year project is working with all six Eastern and Central European countries to provide low cost, quick impact technical assistance and equipment to increase energy efficiency and improve oil purchasing. Eight industrial plants and up to three refineries in each country are being audited and limited low-cost assistance is being provided to implement recommendations. Training courses in international oil procurement will be conducted in May and June 1991, with follow up technical assistance and internships. Energy pricing work has been initiated in Hungary, Czechos-

lovokia, and Rumania, with Yugoslavia, Bulgaria, and Poland to follow.

2. Regional Energy Efficiency Project

The $34 million, 4-year project is in the final stages of preparation and is expected to begin in May or June, 1991. Funding of $14 million is planned in fiscal year 1991. This program will be carried out in conjunction with DOE, EPA, and international organizations. AID will also support technical cooperation activities of DOE and the Nuclear Regulatory Commission in energy efficiency, clean coal, renewable and nuclear safety technologies.

3. Krakow Clean Fossil Fuel and Energy Efficiency Project

AID, DOE, EPA are in the final stages of negotiations with Polish officials on a $20 million, 4-year project to address the serious low-emissions problem in the city of Krakow. The low-emissions are close-to-the-ground emissions (in opposition to high emissions released by major plants) and are very large amounts of particulates and carcinogenic releases from 1,300 small boiler houses (small heat plants) and 200,000 household furnaces. The project will support the development of a market approach to implementing cost-effective technical options that can serve as a model for other cities in Poland and Eastern Europe. The project will finance engineering analyses, pilot installations, policy and incentive analyses, and joint venture promotion.

B. THE ENVIRONMENTAL AND ENERGY STRATEGY FOR 1992

The U.S. environmental and energy strategy for Eastern Europe for 1992 is currently under discussion at the State Department by the main agencies involved in the process and should be consistent with the past policy of environment-energy associated action, with some emphasis on energy.

The State Department's coordination efforts seem to have improved the actions undertaken by the various Federal agencies involved in the process. Still, some U.S. companies claim that they encounter difficulties with the Federal Government in getting the appropriate information, especially those related to financial questions. The American Business Initiative is intended to address this issue.

C. THE AMERICAN BUSINESS INITIATIVE

In order to facilitate the transfer of U.S. commercial expertise and increase the flow of capital to Central and Eastern Europe, and stimulate the involvement of small and medium-size American firms, the Department of Commerce created recently the American Business and Private Sector Development Initiative (ABI). The ABI is a $45 million 2-year project carried out by AID, the Department of Commerce, the Overseas Private Investment Corporation (OPIC), and the U.S. Trade and Development Program (TDP) in partnership with the private sector. The main focus of the program will be on Poland, Hungary, Czechoslovakia, followed by the other Eastern and Central European countries.

A primary objective of the U.S. Government's efforts to assist Eastern Europe is to promote economic reform through the expansion of the private sector. However, for a number of reasons, including concerns about profitability and the need for financial support, U.S. firms have been reluctant to enter these new markets. Underlying the U.S. Government's efforts is the belief that small- and medium-size firms would be more inclined to pursue opportunities in Eastern Europe with active U.S. technical assistance, grant, and capital support.

The ABI is designed to develop and expand programs at AID, Commerce, TDP and OPIC. This project will enhance these programs through six new initiatives which will focus on five key sectors, including energy. Emphasis will be on the creation and expansion of critical infrastructure to support the privatization of state enterprises in the Eastern European countries and private sector development. The strategy of the program is to offer through the six initiatives an element of continuity of support for U.S. firms and their foreign partners.

The six initiatives are briefly described below:

The Consortia of American Businesses in Eastern Europe (CABEE) is custom designed to assist small and medium size U.S. firms in establishing a commercial presence in Eastern Europe through the formation of consortia of American businesses. This $3 million grant program was established for companies that lack the capabilities and resources to approach the East European market as individual companies.

On a pilot basis, an American Business Center (ABC) was set up in Warsaw, Poland to provide needed technical business services and temporary office space on a user-fee basis to the U.S. business community. This 2-year program will provide additional services not currently provided by the private sector in Poland and be phased out as the services become sufficiently available in the marketplace.

The Eastern Europe Business Information Center (EEBIC) was established in January 1990 in Washington to serve as a clearinghouse for information on doing business in Eastern Europe. It will also develop business development seminars in Eastern Europe.

The Trade and Development Program (TDP) finances feasibility studies, reverse trade missions, training programs, conferences and other project planning services relating to priority projects in host country development plans. TDP is funding a wide range of studies in Eastern and Central Europe, including Poland, Hungary and Czechoslovakia. Additional funds provided through the American Business Initiative will be used to meet the increased need for such studies in Eastern Europe.

The Overseas Private Investment Corporation (OPIC) is a self-funded U.S. Government corporation established to encourage and support U.S. private investment in emerging democracies and developing countries throughout the world, including Eastern Europe. OPIC assists American investors through three principal programs: (1) financing with direct loans and loan guarantees; (2) insurance against a broad range of political risks; and (3) investment advisory services, including investor counseling, investment

missions, computerized joint venture matching, and country and regional informational kits.

The Administration is seeking legislative authority to expand OPIC's pilot equity investment program to include Eastern Europe, so that OPIC can make equity investments in promising private sector enterprises involving U.S. business interests. If authorized, this expansion would enhance OPIC's capacity to respond to private financing requirements, particularly for projects undertaken by U.S. small businesses, and including projects involving privatization of Eastern European state-owned enterprises.

The Capital Development Initiative (CDI) is administered by the AID and its objective is to foster the development of infrastructure investment projects in areas where U.S. industries have a clear comparative advantage, including solid or hazardous waste disposal, water supply and treatment, pollution control, energy production, energy conservation systems, and telecommunications projects. The estimated project budget for the CDI is $20 million over the next 2 years.

CDI-funded technical assistance will be project-specific and will complement other initiatives sponsored by the U.S. Government and multilateral organizations. CDI assistance will be structured to serve both Government and private sector clients in the host countries with the following two types of service: (1) financial services concentrated on the preparation, packaging and marketing of feasible projects to available funding sources (public or private); and (2) technical analyses of specific projects.

The CDI will be carried out through the placement of long-term advisors in Eastern Europe who will work with the Government and private sector clients. Also, short-term teams will work directly with government clients or private firms in completing technical or financial analyses needed for marketing investment projects to financiers and securing final investment approvals.

IV. The EXIM Bank Activities

SEED also extended the Export-Import (EXIM) Bank authority to Poland and Hungary, allowing EXIM to guarantee, insure, finance, extend credit, and participate in the extension of credit in connection with the purchase or lease of any product by Hungary or Poland.

For Poland only, SEED established the Trade Credit Insurance Program (TCIP) that allowed short-term EXIM Bank guarantees and insurance for transactions involving U.S. exports to private companies in Poland. The TCIP was extended to medium-term loans and guarantees through the Foreign Operations Act of 1990. TCIP still excluded financing for long-term projects and for U.S. transactions with Poland's public sector. Private sector and EXIM Bank officials saw a need to extend TCIP to public sector projects in Poland, especially since the energy sector is likely to go through a long phase of restructuring before being privatized.

Even before SEED, the EXIM Bank had an unrestricted policy with respect to Hungary. This policy was extended to Czechoslovakia in March 1990, after the Administration adopted in February 1990 a waiver to the Jackson-Vanik amendment of the 1974 Trade

Act, and a declaration providing that it was in the national interest to do business with Czechoslovakia. The EXIM Bank is in the process of adopting the same unrestricted policy in favor of Poland (extending EXIM guarantee to long-term loans and to the public sector), which will be effective as of June 1991, and will operate under EXIM's own risk account.

V. Conclusion

The Central and Eastern European countries' staggering environmental problems required that U.S. environmental and energy assistance efforts focus on immediate action through short-term mitigation of air and water pollution in certain areas. At the same time, long-term U.S. assistance efforts are directed toward prevention of pollution through economic modernization and restructuring and legal framework building. These activities involve representatives from U.S. governmental agencies, the private sector and non-governmental organizations in order to achieve a maximum intersectoral communication and coordination. Bilateral and multilateral arrangements are also being developed. The U.S. Environmental and Energy Program reflects the complex interdependence between environmental, energy issues, economic growth and political reform in the Central and Eastern European Region.

CHAPTER VI. INTERNATIONAL AID

I. Background

This chapter addresses international aid to all of the Central and Eastern European countries. The discussion, however, will concentrate on efforts affecting Czechoslovakia, Hungary and Poland.

The international organizations and the industrial countries have been helping the Central and Eastern European countries since the 1989 upheavals. The European Community (EC) Commission was first authorized in 1989 to coordinate the aid to Poland and Hungary through the PHARE (Poland, Hungary, economic restructuring) program, that was provided by 24 Western countries known as the G–24. This aid was extended in 1990 to other Central and Eastern European countries.

The mandate of the G–24 Working Group on Environment was extended in December 1990 to cover energy matters as one of the priority sectors for coordinated assistance. The Group's efforts included the identification of primary areas for international cooperation.

Representatives of the EC Commission, the International Energy Agency (IEA), the World Bank, and the European Investment Bank (EIB) met in January 1991 to coordinate their activities and avoid duplication of tasks and financial resources, and exchange information on their ongoing and planned projects (annex 1, 2, 3). The European Bank for Reconstruction and Development (EBRD) was created in 1990 in order to help promote private enterprise in these countries.

The Pan-Europe Energy Charter was adopted by the EC Commission in February 1991. The purpose of the Charter is to reinforce cooperation between energy producers and consumers in East, West, and North Europe by creating a large European Energy market in which the Soviet oil and natural gas would play a major part. The term "Pan-Europe" indicates that it involves not only the EEC members but also the other European countries.

The European countries will have to meet by the end of 1991 in order to formally adopt the Charter. The EC Commission is also currently negotiating an association agreement with Czechoslovakia, Hungary, Poland, that would give them political membership to the EEC.

The Coordination Committee for Multilateral Export Control (COCOM) is about to ease export restrictions to the Eastern bloc, which will make it easier for U.S. companies to sell its high technology products.

II. G–24 Assistance to Eastern European Countries

At the Paris Summit of the Arch on July 14–15, 1989, the G–7 (the seven most industrialized countries) decided to support the economic reconstruction of Poland and Hungary. The EC Commission was mandated to coordinate aid to these two countries. Twenty-four western countries subsequently became associated with this operation (G–24), that was initially called the PHARE program. G–24 included: the United States, Canada, Japan, France, former West Germany, Italy, Great Britain, other EEC members, Austria, Switzerland, Finland, Island, Norway, Sweden, Turkey, New Zealand, Australia. In 1990, the aid was extended, in principle, to other Central and Eastern European countries, (except the U.S.S.R. for which a separate program was set up), provided that they carry out the requisite political and economic reforms.

Priority areas for the aid program were: market access, agriculture, environment, investment and economic reform. Based on these priority areas, separate working parties of G–24 were established: agriculture, investment, training and environment. Energy issues were addressed in the framework of the working party of environment.

At the High Level Meeting of October 30, 1990, the G–24 agreed that energy should become a priority sector for coordinated assistance. The EC Commission, in coordination with the IEA and other international organizations was invited to compile an inventory of priority requirements for assistance by the G–24. Following this meeting, the G–24 working group on environment was extended to cover energy matters and held its first meeting on December 21, 1990.

The G–24 proposed the following framework of areas for cooperation that would be negotiated with the Eastern European governments, and represent a main guideline for assistance in the medium and long term:

For all countries:

1. Energy planning and policy formulation, including notably pricing and reorganization of the energy sector
2. Energy conservation and efficiency
3. Environmental aspects of the energy sector
4. Nuclear safety
5. Energy statistics.

More specifically, for Czechoslovakia, Hungary and Poland, the G–24 identified the following projects:

Czechoslovakia:

1. A study of energy conservation in industry to identify industries to be given priority treatment
2. Natural gas (fuel substitution)
3. Security of oil supply (interconnection and modernization of pipelines)
4. Desulphurization and reduction of nitrogen oxide emissions from coal fired power plants
5. Technology transfer to modernize the energy sector

Hungary:

1. Cooperation on energy conservation with institutions (e.g. with the Hungarian Energy Efficiency Office)

2. East-west energy links (oil trade, electricity grid, and natural gas pipelines)
3. Expansion of domestic power generation capacity
4. Environmental aspects of oil refineries

Poland:

1. Establishment of a regional agency for energy conservation
2. Institution of conservation program for the transport system
3. Legal support for the efficient use of energy
4. Analysis of investment choices in the energy sector and review of the role of government in relation to investment in the energy sector
5. Development of a framework for formal relationships between government and state owned energy industries in the medium term
6. Development of programs to limit social dislocation generated by restructuring of the coal industry, particularly in Lower Silesia
7. Cooperation on the repowering of power plants, particularly in relation to meeting environmental regulations. The main requirement is in identifying sources of investment capital
8. Maintenance and improvement of district heating sytems. Major requirements are restructuring of pricing systems, installation of metering systems, maintenance and protection from corrosion of valves and piping
9. Environment: low cost options for the control of emissions for small combustion sources
10. Modernization of distribution system, notably in the oil products sector
11. Study of options for gas imports in conjunction with the needs of other countries, with particular attention to the evolution of absolute and relative costs of gas
12. Feasibility studies on renewable energy sources (e.g. geothermal energy)

III. Western Assistance in the Energy Sector

The EC Commission's own cooperation program for Eastern Europe, so far covering Poland, Hungary, Czechoslovakia and Yugoslavia, has been in place for more than a year. This assistance, which is of modest financial proportion (ECUs-European Currency Unit-1.4 million in 1990), is currently directed at the enhancement of the institutional capacities, particularly at city and regional levels, the development of energy policy and planning and the improvement of energy efficiency in industrial enterprises.

The 1990 PHARE program already contained an important energy component. About a quarter of the ECUs 100 million set aside for assistance with environmental protection programs in Hungary, Poland, the former GDR and Czechoslovakia this year will be used for projects with a specific energy component.

The efforts of the IEA, which is not a financial donor organization, are directed mainly at sharing expertise with the Central and Eastern European countries' governments on energy policy. The

particular focus of IEA's efforts is an analysis of options for fostering market based energy sectors. Assistance is being provided through two main approaches: (1) the evaluation and development of energy strategies through the IEA's country review process, and (2) serving as catalyst for the resolution of energy policy issues and problems through conferences, seminars and workshops.

The World Bank's objectives in Eastern and Central Europe are to provide technical assistance to help governments, agencies, producers and consumers to develop energy strategies, policies and investment programs for more effective and efficient energy production, consumption and trade, environmental management strategies, policies and programs related to the production, trade and consumption of energy, and promote intra and interregional energy trade.

The European Investment Bank (EIB) is already active in Poland and Hungary in the oil, gas and electricity sectors.

The United Nations Economic Commission for Europe (UNECE) has concentrated its efforts on studies, workshops and seminars in the various energy sectors. A data bank with statistics on the Central and Eastern European countries is also available.

IV. Coordination of International Assistance

Representatives of the EC Commission, the IEA, the World Bank and the EIB met from January 31 to February 1, 1991, to identify the most efficient means to assist the Central and Eastern European countries, notably in order to avoid the duplication of tasks and the overburdening of the administration of these countries, and to exchange information on ongoing and planned projects. At their request, U.S. representatives attended the meeting as observers.

The following six priority areas of assistance were identified with varying degrees of emphasis for each country:

1. Energy efficiency and conservation;
2. Energy pricing reform;
3. Energy management and planning;
4. Restructuring of the energy industry;
5. Geographic diversification in the oil, gas, and electricity sectors, including interconnection of networks;
6. Environmental consequences of energy supply and use.

Each of the participants described, in general terms, their ongoing and expected future activities which are detailed in annex 1. Participants also exchanged information on each country's major ongoing or planned actions which are detailed in annex 2.

With regard to Poland and Hungary, where cooperation is already fairly well advanced, specific areas were identified where coordination between donors is needed to avoid duplication.

Concerning Hungary the areas identified were:

1. Energy conservation and efficiency;
2. Electricity sector (interconnection);
3. Gas sector (pricing and interconnection)

Concerning Poland the areas identified were:

1. Energy conservation and efficiency;
2. Privatization;
3. Refining sector

Also with regard to Poland, it was noted that several donors were interested in participating in the establishing of an energy efficiency center. As regards Czechoslovakia and Yugoslavia, it was noted that the institutional developments on both the Federal and republic levels should be carefully monitored.

Aspects of regional cooperation between Central and Eastern European countries were also discussed as detailed in annex 3. Five countries created the Pentagonale, in order to deal with their common interests: Hungary, Czechoslovakia, Yugoslavia, Austria, Italy. It was noted that the regional aspects of refining and the oil market could be studied jointly. A joint seminar for natural gas was suggested as well as for electricity.

V. The Creation of the EBRD

The creation of the European Bank for Reconstruction and Development was suggested at the initiative of the French Government, during the Paris Summit of November 18, 1989, the European Council approved the creation of the European Bank for Reconstruction and Development (EBRD) on December 8–9 1989. The final text determining its status was signed in Paris on April 9, 1990.

The EBRD's objective is to encourage the transition toward free market economy and to promote private and individual enterprises in Central and Eastern Europe. The EBRD includes 42 shareholders: 40 countries (including Central and Eastern European countries, the 7 most industrialized countries), and the EC Commission and the EIB.

The EBRD should be operational by the end of 1991-beginning of 1992. The headquarters have been located in London, Great Britain.

VI. The Lubbers Memorandum and the EC Pan-Europe Energy Charter

Dutch Prime Minister Lubbers presented at the Dublin European Council held on June 25–26 1990, a memorandum aimed at linking the complementary needs and energy resources of the EEC, the Soviet Union, and Central and Eastern European countries.

The memorandum called for the development of an European Energy Community, and stressed the fact that just as the creation of the European Coal and Steel Community after the Second World War became the symbol and the instrument of the ideal of "no more war" (particularly between France and Germany), the creation of an energy community for Europe could make an important contribution towards preventing new walls from dividing the European continent in the future.

A community of this kind could also serve another general political aim by preventing Europe from becoming too heavily dependent on other parts of the world for its energy. In that regard, the memorandum recommended that the production, transportation, and use of energy be organized in a different, more integrated and better way, and that besides energy saving, European countries develop new natural gas and oil reserves, clean combustion technolo-

gy for fossil fuels, the safe use of nuclear energy, and the linking of individual electricity supply grids.

Following the Lubbers memorandum, EC Commission President Jacques Delors developed at the November 21, 1990 CSCE Paris Summit, the Commission's idea on a European Energy Charter.

The EC Commission adopted recently on February 13, 1991 a Pan-Europe Energy Charter for reinforced cooperation between energy producers and consumers in East, West, North Europe. EC energy officials believe that the Charter should work to everyone's advantage: (1) EC countries should be ensured better access to Soviet oil and gas reserves; (2) pollution free technologies and a more diversified mix of energy supply would be available for East European countries; and (3) the Soviet Union would get the help it needs to modernize its energy infrastructure.

The Charter is expected to be formally adopted at an all-European energy conference at the end of this year, probably after Dutch Prime Minister Lubbers takes over the EC Council Presidency in July 1991. In may 1991, the EC Commission just sent a delegation to the Soviet Union in order to present the Charter.

EC officials caution, however, that the Charter is not aimed at the construction of an inward looking European energy community, but will contribute to the dynamism of the international economy. Some EC officials stress that U.S. technology will be needed for exploration and drilling in near-Arctic conditions.

The United States and Japan have already requested to participate in the negotiations. However, it is likely that the negotiations will include European partners first, but the other countries would be allowed to join specific areas of the pact at a later date.

Legally, the charter will take the form of a "code of conduct", i.e. specific protocol that all signatories will agree to respect in drawing up subsequent bilateral arrangements. Its main objectives will include:

1. The development of energy exchanges between participants based on unhindered access to existing and future resources, elimination of technical and administrative barriers and development of infrastructures,
2. Cooperation and coordination in the drafting of statutes rules for the development of energy resources, harmonization of technical standards and security norms,
3. Environmental protection, including development of new and renewable forms of energy.

These objectives will be implemented through joint actions focusing on the following specific areas:

1. Participants must commit themselves to making it easier for economic operators to gain access to their energy resources by adopting appropriate rules for the exploration, development and acquisition of energy supplies.
2. All discriminatory practices must be removed in the development of resources,
3. Investment rules should allow for the repatriation of profits,
4. Trade obstacles and hurdles in the cross-border transit of energy supplies should be removed. The interconnection of ex-

isting energy networks will be encouraged and so will technology transfers and pilot projects.

Priority areas for the conclusion of bilateral pacts include:

1. The nuclear sector and nuclear safety improvement
2. Coal mining and clean coal technology
3. The rational use of energy
4. The development of renewable energy
5. The development of oil and gas resources, transportation, and modernization of refineries
6. The modernization of power plants and interconnection of networks, and high voltage electricity transmission
7. Technology transfer and incentives to innovation.

VII. The Coordination Committee for Multilateral Export Controls (COCOM)

The United States and its allies for years have kept Western technology out of the Soviet Union and Eastern Europe through the Coordination Committee for Multilateral Export Controls (COCOM).

COCOM which consists of all NATO countries (except Iceland), Japan and Australia, was created at the beginning of the cold war to restrict the flow of western technology to Communist countries. Faced with the new political events in the Eastern Bloc, COCOM is trying to increase the flow of high technology to the East while still protecting Western security interests. Thus, the Western countries are about to ease stiff export restrictions, which will make it easier for U.S. companies to sell to the former East Bloc sensitive technology products.

The new COCOM standards will help determine the pace of modernization in Eastern Europe and the Soviet Union as well as the level of technology of the products which will be exported by U.S. companies in the region. The United States proposed that more liberal standards should be applied to Eastern Europe than to the Soviet Union, because of Eastern European countries' stronger commitment to free market economy reforms. The energy industry, especially oil and natural gas, which is using computer technology is directly concerned by these regulations.

A general agreement should be reached in May 1991, for Poland, Hungary and Czechoslovakia, that would liberalize all U.S. personal computer exports to these countries. In contrast, the biggest supercomputers, which include highly sensitive technology, will be still subject to a case by case review process.

VIII. Conclusion

International organizations are providing various types of economic, financial and technical assistance to Eastern European countries. Some parts of this international aid also include an important political dimension.

In the face of the multiple challenges to be met by the Eastern European countries, the coordination effort initiated among the international organizations will help to prioritize their numerous needs. As these projects are implemented, they are also transforming the general framework of economic and political relationships in Europe.

ANNEX 1

LIST OF ASSISTANCE PROGRAMS TO CENTRAL AND EASTERN EUROPE

EC Commission

1990:

Bilateral program: Hungary, Poland, Czechoslovakia and Yugoslavia, ECUs 1.5 million.

PHARE: Poland, Hungary and Czechoslovakia, ECUs 20 million.

1991:

PHARE: ECUs 3-5 million per country has been planned. PHARE financing is normally in the form of grants.

EIB

1990:

Lending program focused on Poland and Hungary. Other countries will also be covered, subject to political decision.

World Bank

Nine billion dollars will be available for 5 years (all sectors, six countries), the energy sector may consume 20 percent of these funds.

Together with UNDP (United Nations Development Program) an "energy planning project" exists (institution building, seminars, energy planning).

The World Bank may in the future set up a "Central and Eastern European Regional Program" for preinvestment and technical assistance.

The World Bank has been active in Poland, Czechoslovakia, Hungary and Yugoslavia; activities in Romania and Bulgaria are being initiated.

IEA

1990:

FFR (French Francs) 1.5 million.

1991:

FFR 4.5 million.

IEA activities have focused on general assessment of the energy situation in these countries. A review of Poland has been carried out and is almost completed; Hungary and Czechoslovakia is to follow soon.

ANNEX 2

ONGOING AND PLANNED ACTIONS IN THE CENTRAL AND EASTERN EUROPEAN COUNTRIES

The following issues have been identified:

Hungary

Country energy review—IEA planned
Energy management in Miskolc—EC study
Energy saving campaign—WB, EC planned
Energy audit in several food industries—EC study
Energy audit in steel/coal sector—WB planned
Third party financing-EC study
Power project—WB study
Co-generation—WB study
Electricity interconnection—EIB study
Electricity—U.S., in preparation
Refinery—EIB, U.S.
Gas—WB, U.S. study

Poland

Energy efficiency center—U.S. planned
Energy data and statistics—EC training visit
Energy management in Bydogski and Gliwice—EC study
Country energy review—IEA study
Refineries/modernization—EIB preliminary
Restructuring of oil sector—EC study
Oil purchasing—U.S. in Gdansk
Development of oil fields—EIB
Gas—WB, EIB
District heating—WB, under appraisal
Restructuring of power sector—WB, under preparation
Cogeneration—U.S., in Gdansk

Czechoslovakia

Energy efficiency in the building sector—EC study
Energy conservation—EC identification of priorities
Energy pricing—U.S., under discussion
Training visit of CSFR officials on regional and local energy policy—EC

ANNEX 3

REGIONAL ISSUES

Gas

Work of Pentagonale and ECE/UN is to be taken into consideration.

EC co-sponsors study on Mediterranean gas.

Suggestions of donors to organize seminar on regional gas issues.

Transit gas pipeline (U.S.S.R.-Yugoslavia via Hungary).

Electricity

IEA suggestion to organize seminar on interconnection.

Oil

Hungary seems to be interested in regional approach.

World Bank team studies in Czechoslovakia.

World Bank preliminary studies on regional refinery sector.

Nuclear safety

EC prepares twinning scheme.

Mutual problems seem to exist between Romania (chemical factory) and Bulgaria (nuclear plants).

Pentagonale addresses also this issue.

Energy and environment

World Bank is active in Hungary, Poland (coal, gas) and Czechoslovakia/Hungary (Gabcikovo/Nagymaros).

Regional efficiency projects

World Bank seeks collaboration with EC.

The regional aspect is notably the sharing of experience in each of these six countries .

SUMMARY AND CONCLUSIONS

The political and economic situation in Eastern Europe remains unstable and is evolving rapidly. Czechoslovakia, Hungary and Poland undoubtedly are the most advanced countries in Eastern Europe in terms of their modernization process and the implementation of free market economic reforms.

The year 1989 was one of major political changes; in 1989–1990, international organizations and Western countries started conducting studies in these countries, and providing technical and financial advice and help. Czechoslovakia, Poland, and to a lesser extent, Hungary (which was already very advanced in its free market economic reforms), are only starting to implement their legal and economic restructuring programs. These countries' energy policies and the issue of the energy sector denationalization and privatization will be the object of public debate in 1991.

Poland is in the midst of a drastic economic modernization effort that some have characterized as a shock treatment. Among the three countries considered, Poland has the least developed economy. Therefore, Poland must modernize and restructure its whole economy before it will be attractive to private investment. According to international experts, international and foreign government assistance may be the most appropriate form of action under current conditions. However, Poland's drastic economic reforms may help this country catch up with Hungary and Czechoslovakia in the coming years.

In contrast, Czechoslovakia and Hungary are more established industrial nations and offer at present more attractive investment opportunities for the private sector. Nonetheless, both countries still need to complete a denationalization and privatization program. While Hungary has already attracted massive German investments, partly because of its traditional cultural links with Germany, Czechoslovakia, according to U.S. private companies, appears to be more interested in U.S. products and investments.

Some form of government support would make U.S. companies more inclined to do business and invest in Eastern Europe. The ABI program, recently created to assist small and medium-size firms, seems to be designed to serve such purpose. Larger companies hope to get the same support as that provided to Japanese and German companies by their respective governments, namely government guarantees and low interest rates. On the first point, the EXIM Bank recently extended to Poland the unrestricted policy it applied to Hungary and Czechoslovakia. As regards to low interest rates, it has always been the U.S. Administration's policy not to provide below market interest rates.

The prospects for successful U.S. assistance programs for Eastern Europe have improved, particularly in the wake of the State Department's efforts to coordinate the activities of the various Feder-

al agencies with a stake in the issue. United States efforts also are being coordinated with the activities of international organizations. The U.S. efforts recognize the complex interdependence between environmental protection, energy production and consumption, economic growth, and political reform in the region. The U.S. coordination effort should be pursued and adapted to the further economic and political changes that will take place in the emerging democracies of Eastern Europe.

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Private Communications With the Following Institutions

World Bank
EC Commission
Agency for International Development (AID)
Department of Energy (DOE)
Department of State
Department of Commerce (DOC)
Overseas Private Investment Corporation
Export-Import Bank (EXIM Bank)
U.S. Energy Association

Abbreviatons

AID	Agency for International Development
DOE	Department of Energy
DOC	Department of Commerce
EPA	Environmental Protection Agency
CMEA	Council for Mutual Economic Assistance
CPE	Centrally Planned Economy
EEC	European Economic Community
IMF	International Monetary Fund
OPEC	Organization of Petroleum Exporting Countries
ECU	European Currency Unit
GDP	Gross Domestic Product
GNP	Gross National Product
LNG	Liquified Natural Gas
HFO	heavy fuel oil
El.	electricity
D.H.	district heating
t	tonne
toe	tonne of oil equivalent
mt	million tonne
mtoe	million tonne of oil equivalent
bnt	billion tonne
bbl	barrel
mcm	million cubic meters
bncm	billion cubic meters
TWh	terawatt hour
MW	megawatt
PJ	petajoule

Conversion Factors for Energy Units

0.028 cubic meters/cubic foot	0.136 metric tons/U.S. barrel
35.315 cubic feet/cubic meter	7.33 U.S. barrels/metric ton

Statistics

Statistics coming from the Eastern European sources can be inaccurate and sometimes difficult to match with data from other sources. These statistics are presented only to give a general idea of the country's energy profile.

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